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THE PLOUGH

THE LOOM AND THE ANVIL.

FARMER AND MECHANIC.

DEVOTED TO SCIENTIFIC AND PRACTICAL AGRICULTURE—MANUFACTURES—MECHANICS—NEW INVENTIONS—A SOUND PROTECTIVE POLICY—FARM BUILDINGS—COTTAGE DESIGNS—FRUIT TREES—FLOWERS—GARDENING—BEES, CATTLE, HORSES, HOGS, SHEEP, POULTRY, &c.

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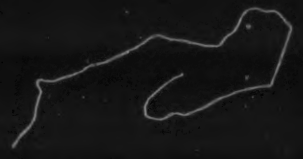


The Plough, the Loom, and the Anvil.

PART II.—VOL. V. JUNE, 1853. No. 6.

NATIONAL AND INDIVIDUAL SUCCESS.

THERE are truths which are universally acknowledged and readily applied in the every-day matters of practical life. They are not only professed, but appreciated. Other truths, equally obvious and as uniformly acknowledged, are often practically contemned and habitually violated. Illustrations of either class are numerous and familiar. Nor are they confined to one or two departments of science, nor to a few only of the industrial pursuits. Thus, all profess and believe that government is for the good of the many, and not of the few only; that public officers are but public servants; that what is done should be done well; that economy and industry are the pillars of success; that a good market, close at hand, enhances the value of what one has to sell; that it is inexpedient, *economically* considered, to employ others to do that which one can do just as well for himself, and that the laborer is worthy of his hire.

Why are not all these truths, and many others equally obvious, practically honored in every man's every-day business? There is scarcely one of them that is not frequently violated. Formal political creeds, which resolve by unanimous consent the soundness and importance of some of these truths, have also given them a flat denial. Stump-orations and speeches *for bunkum* will commend and repudiate it in the same hour. For example: Who denies that it would be unwise for a man to build his saw-mill or his grist-mill 10 miles or 100 miles from his home, when he could have it within 10 chains or 100 rods just as well. Yet there are not a few among us who choose to send our products 3,000 miles, there to be worked into valuable commodities, rather than have the same work done at our own door, where we might retain all the profit.

At this hour the cotton of Africa and India, as well as of North and South America and the islands, is carried to England to be spun and woven; and the manufactured goods are returned to the very spot where, by hard labor, their materials were obtained from the bosom of the earth. They are there wrought into merchandise and sold at high prices, making rich the foreign manufacturer, and establishing a government with energies and resources without a parallel on the face of the earth.

Let it not be overlooked or forgotten that it is this very process of monopolizing the manufactures of the world that makes Great Britain politically and financially what she is. It is this identical tribute which she exacts from foreign nations that not only feeds her crowded millions, but which makes her mistress of the sea and a sort of universal umpire over the destinies of nations. Shut up her factories and workshops that depend on foreign material and foreign markets, and she sinks at once to a second or

third-rate power,—nay, the very foundations of her present government would give way. The weaver vanishes with the loom, the spinner with the mule; and with the knives and "Damascus blades," the chisels and axes and hammers and saws which she has almost exclusively manufactured, the makers of them would disappear, and for ever. Let the ring of the anvil, and the bellowing of the furnace, and the clatter of the shuttle and the loom be heard on the spot where the material to be manufactured was brought into being or dug up from the darkness beneath, and the smoke of English furnaces and English forges would no longer shut out from millions of her inhabitants the clear light of the sun. Nor would a degraded and crowded population cling to their miserable hovel-homes, and work out their very life for a mere pittance; but they would seek, as their neighbors are now seeking, a better home, where labor is more liberally paid for, and industry receives a more satisfactory reward.

We remind our readers again and again of these doctrines, and the results of the policy which we urge, not because we desire to see English pride humbled or her dread power paralyzed. Her pride does us no harm—her power is habitually exercised for good. But we would thereby illustrate the importance of securing to our own people that same glory and grandeur which this policy has secured for that little island.

There is no reason why the same policy should not produce the same results elsewhere that it has in England. She has no prescriptive right to hold a monopoly of sound principles in political affairs, nor are those principles more effective in that country than elsewhere. She has no secret alchemy by which she alone, under a wise administration of affairs, can turn industry into immense riches or vast political power. But she has monopolized much of the practical wisdom of the world, and, as a matter of course, has secured a magnificent triumph in arts, in science, in moral influence, and in physical power. Her sons, unwilling to submit to her severe requisitions in matters of conscience, abandoned home and fatherland, and settled this western world. Like other good and energetic parents, she attempted to chastise their rebellion, and bring them back to submission, and to keep them in dependence on her favor; and though she failed, nominally, in all these efforts, and actually and entirely failed to produce any desirable results by forcible measures, she has contrived to bind a three-fold cord around the industrial energies of this young nation, and to crush in embryo, by the policy she has inculcated, the projects which have been proposed for their adoption. She has persuaded not a few of our citizens that, though they are free and independent, we cannot get along very well without her aid; and we are therefore compelled—not to send our cotton to her to be manufactured and returned, charged with the paltry cost paid out to the laborers employed upon it, with moderate commissions, brokerage, &c., but—to sell at her prices our chiefest staples, and with the proceeds, or rather for the goods thus delivered, to receive back other goods which we might just as well manufacture for ourselves, for which the raw material is most abundant and most accessible; and this also not at the rate we can afford to give, but at the prices she chooses to demand. We regard either of these modes of operation as unworthy of favor, and constantly and increasingly injurious in their tendencies. Surely, this is a remarkable specimen of living *independence;* but the printer must space out the word, and, by diminishing its number of syllables, add materially to its truthfulness.

Suppose we cannot manufacture some goods quite as cheaply as England can, it does not follow that the policy against which we contend is the true

policy. One historic fact is established beyond controversy: No nation has ever arrived to the permanent possession of great wealth and power without sustaining successfully a great variety of industrial pursuits. Nor is it possible, in the nature of things, that this should ever cease to be true. Trade is the basis of all industrial prosperity. Where each one supplies for himself his own wants, he must be limited alike in his indulgences and in his ability to buy. Even the farmer is dependent upon trade for his moderate supplies, and his success is the only true basis for the vastly greater success of the merchant.

What is trade? Trade is "the exchange of commodities." The phrase belongs, therefore, as much to the farmer as to the merchant; and whatever affects his interest, to a greater or less extent affects all departments of trade. Destroy the power of *laborers* to buy, and you will materially diminish the sales of importers and of manufacturers. Pay liberal prices for all kinds of *labor*, and almost the next hour the effect of doing so is felt in the counting-rooms of the largest importers and wholesale dealers. It is the success of the masses, the yeomanry of the country, that brings wealth even to the richest. It is a matter of universal concern, therefore, to pursue that policy which shall be favorably felt by that large and controlling class. These influences are all mutual. Thus, the establishment of villages devoted to manufacturing purposes and the arts, is not only advantageous in giving useful employment to hundreds who otherwise would be comparatively useless in society, but also in opening new and more convenient markets; in practically creating markets for a greater variety of articles, and improving the market-prices of the ordinary products of labor. Thus, the value of land within the boundaries of these villages is often increased five and ten-fold, and is greatly enhanced even beyond their borders.

It is in such communities almost exclusively—that is, in the neighborhood of large markets—that the accumulation of large estates is ever witnessed. We refer—not to the immense fortunes of hundreds of thousands, in obtaining which more than ninety are ruined where far less than ten per cent. exceed, but—to those comfortable and liberal estates which give their possessor sufficient independence without an almost crushing weight of care and anxiety, and in the procuring of which, comparatively few are shipwrecked. The large fortunes are chiefly in that class which *bid high*, and for obtaining which, men most usually run great hazards. In such transactions, loss and complete ruin are generally mere synonyms.

The general interests of the people are dependent rather upon success of a different kind. The items are smaller, but the grand total is by no means less important. For example:

It is not uncommon to see in our papers such statements as the following: "A. B. has made a net profit this year of $1,500 from his strawberry beds." "C. D. has acquired a pretty property from the sale of garden vegetables." "E. F. has sold, this year, $2,000 worth of peaches;" &c., &c. These are facts. These sums are actually realized, and a reasonable proportion of the amount is clear gain. Every day, for weeks, we have known peaches sold in one of our large cities at $3 per dozen; grapes from 75 cents to $1.50 per lb.; nectarines at $1.50 per dozen, and so on. And even at these prices, sales are made in large quantities. We recollect orders, each for 10 or 15 lbs. of grapes, at the highest price above-named. These are the little rills which make the mighty rivers.

But who ever saw this in a community of mere farmers? No one. Every body may understand why this is so. When all are producers of a given

article, of course that article can find no home-market. And again, those who sell nothing cannot afford to buy. Hence the value to the farmer of being in the midst of a community devoted to other pursuits.

If he could secure this at the cost of half his farm, the loss would be more than made up by the increased value of the half remaining.

Nor are large cities alone the means of dispensing wealth and power among communities. We remember, years gone by, a dry, sandy pine-plain, the silence of which was seldom broken by travellers from a distance, or even by the ordinary bustle of rural life. An old red tavern looms up on the picture we have preserved of it, which we used to see in our annual visit to an aged grandfather. The next town, across the river, was of the same character. Poverty was written most legibly on the sign-board at the corners of the ways, and this same word was echoed from every sand-hill. But, as if by magic, the sound of the axe, and hammer, and mallet, the harsh grating of the saw, and the blasting of rocks, broke in upon this silence, and a little city rose upon the spot. Now, tens of thousands of spindles hum their monotonous song, and more than a thousand shuttles drive through the mazy web. Manufactures! manufactures! these have wrought the change. These alone *could* do it, and yet the manufacturers are paid perhaps ten times what the poor laborers in England would demand for the same service.

And who is benefited? Every trade and profession. The brickmaker, the lumber-dealer, the sawyer of lumber, the carpenter, the mason, the blacksmith, the machinist, and so on to the end of the chapter. Not even widows and children are excluded from this universal panacea.

Nor is this financial view the end or the most important result of these principles. Industry promotes virtue. Its influence is positive for doing good, and efficient in preventing much evil. In a late number (October) we described an embryo project for giving employment to the floating population of this city, and the large workshop of the "American Union Boot, Shoe, and Leather Manufacturing Company," in the establishment of which, J. R. Pitkin, Esq., was most active, was specifically referred to. At this day, in that shop, are boys who, with three weeks' experience, earn $1.50 per week, and with an experience of three months, two or three times that sum. Mr. Pitkin says: "I know a boy, twelve years old last summer, who made the holes and drove thirty-five pegs in children's shoes, in one minute. His regular wages were $10 per month and board."

This is one instance, among the millions, in which the encouragement of domestic industry accomplishes vast results. When all of this class of our population find steady and remunerative employment, the Five Points Mission may move higher up the city, and our Tombs be conveniently located in some of the more elegant avenues.

PROFITS OF FARMING

At a late agricultural meeting in Boston, Mr. Proctor remarked that "he had no doubt that in his county there were farms which yielded $1500 or $2000 per year. Mr. Ephraim Brown, who owns a farm in Marblehead, had informed him that he had sold the produce of his farm in market for $5,000 in one year, and one half of that was clear profit. Half an acre of onions yielded 600 bushels, which sold on an average for 40 cents. Still Mr. Proctor believed there were many more farmers who come short of $300 per year, than of those who go beyond it.

Col. Wm. E. Faulkner, of Acton, said that in his town there were farmers who had made money within the last twenty years. But they were men of iron constitutions, who got along with but little hired help. They went 25 miles to market before the railroad went through the town, and made $600 per year, chiefly on hay. He believed that a time was coming when farming would be more profitable than now, because in the South and West the soils are becoming exhausted from improper management.

FORCE OF WINDS.

On the island of Martha's Vineyard, in that part of it called Nashauquitsy, there is a natural curiosity illustrative of the force of winds. It is a tree of the hornbeam kind, which stands in the centre of a small cove in a hill, in such a position that the wind blows upon it from an easterly direction, and can blow from no other. Consequently, at the elevation of near twelve feet the trunk begins to curve to the westward. The westward growth projects from the tree about twenty-five or thirty feet. Not a limb projects to the eastward. The same kind of tree, left to grow according to the usual laws in protected places, is quite comely and of good proportion in its growth.

The above, from the *Scientific American*, is one illustration of a common phenomenon on our more exposed sea-coasts: at Nahant, near Boston, for instance, there is a very marked declination of all the tree-tops towards the land.

There is another analogous appearance—though the result of different causes, as we suppose—in all our forests of hemlock. The ends of the topmost branches are all turned towards the east. We are unable to give so satisfactory an explanation of this, although it is attributed to the effects of the morning sun, somewhat on the principle by which the sunflower *is said* (incorrectly) always to turn towards the sun.

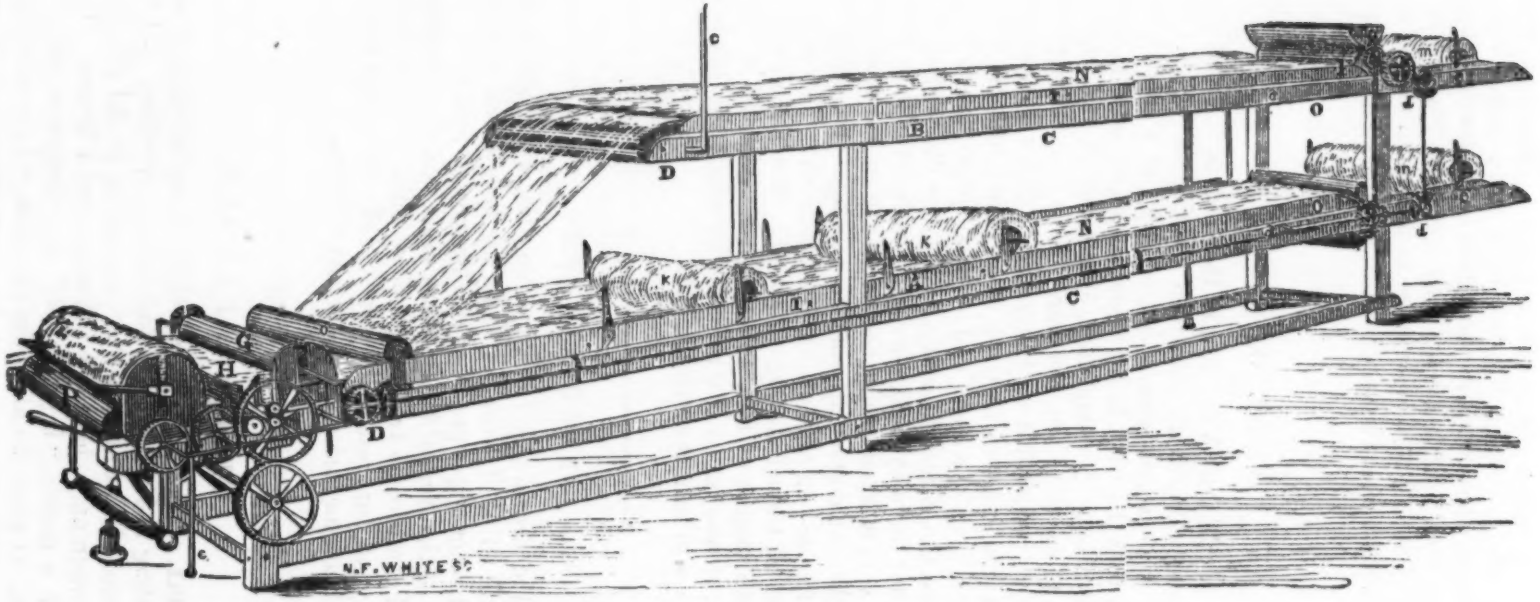
FEEDING BEES.

"Put a pound of brown sugar in a low tin dish, wet it with water, and lay a number of small strips of wood across for the bees to rest on while at work. One pound of six-cent sugar produces two pounds of honey."

Our neighbor of the *Scientific American* must revise his chemistry. How a pound of food can become two pounds of secretion, besides supporting the animals, it is beyond our reach to discover. We have seen the same statement before, and commented on it in our last number.

I'D BE A FARMER.

Dr. Coggswell, of Bradford, Mass., related a capital story at a Legislative agricultural meeting in Boston. He had been a physician, and the primary cause which induced him to turn farmer, was seeing an old picture, representing a king, a clergyman, a lawyer, a physician, and a farmer. The king was represented with a motto, "I govern all;" the clergyman with, "I pray for all;" the lawyer, "I plead for all;" the physician, "I prescribe for all." The farmer was reluctantly drawing out his purse, inscribed, "*I pay for all.*" This showed him the true dignity of the farmer.



WADDING AND BATTING MACHINERY.

WADDING AND BATTING MACHINERY.

THE annexed engravings are views of an improved machine for sizing, drying, and doubling textile materials for wadding and batting purposes. It is the invention of Hiram J. Lawton, of Troy, N. Y., who has taken measures to secure a patent. It has already appeared in the *Scientific American*.

Fig. 1 is a perspective view of the machine when put in operation. A and B represent two sections of a strong frame, one elevated a shor distance above the other, and somewhat shorter. Each of these two sections contains a drying-chamber, with small steam or hot-air pipes running horizontally from D D to O O, but more clearly seen in the longitudinal section, fig. 2, in which R is the pipe, intersecting with a cross-pipe at *a*, where the heat is admitted, through the side of the box, and extending to *t*, where the heat passes out. These chambers are formed by closing up the under side of the frame, also the ends, in order to prevent the escape of the heat, except upward through the sized material, which is carried over the chambers by endless aprons, operated and driven at D D. These aprons are made of slats fastened at each end upon bands or chains, on each side of the chambers, and are placed from 4 to 6 inches apart, as seen in fig. 2, at C; they are kept in a horizontal line, by means of cross-bars, underneath at I I I; these bars also prevent the apron from touching the heated pipes, in their revolutions around the drying-chambers.

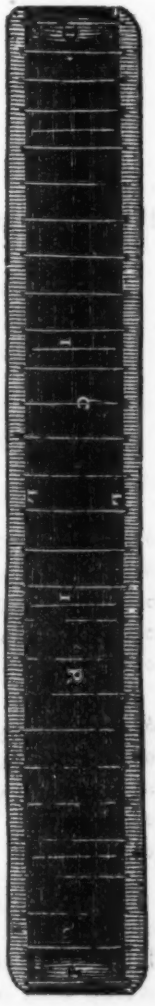


FIGURE 2.

The object in arranging these drying-chambers in two sections, one above the other, is for the purpose of sizing and drying the sheets forming the upper and lower surfaces of the bat, independently of each other, and also for the purpose of facilitating the introduction of any number of bats of fibrous material between the sized sheets, in order to increase the thickness, suitable for all purposes.

In doing this, a roll of carded cotton, or other material to be sized, is placed upon the small cloth apron on each section, at *m m*, immediately in front of the size rolls, O O; these size rolls may be made hollow, with a steam-packed journal, for the admission of heat to keep the sizing warm. The one in the lower section, fig. 2, has the size box underneath, and sizes the under surface of the bat; the one in the upper section has the size box arranged with an aperture in its bottom, and fixed with set screws, in order to raise it from the roll, so as to regulate the quantity of sizing upon the upper surface. After passing over the drying-chambers and receiving one more bats of the same material, or any other, such as wool, flax, &c., the whole combination is brought together at O, and passes to G, which is a pair of heated rollers for the purpose of warming both surfaces. The bat is then compressed firmly together at H, which are two sets of callender rolls, heavily weighted when necessary. Between these the wadding is cut off at any required length, by means of an index which is adjusted so as to regulate the cut-off; the whole then passes to two heated rollers at P; these serve to dry off any dampness which might

remain, and also roll up the finished wadding; it is then taken off and put up for use.

We have been informed that the above machinery operates in a very satisfactory manner; its principle of operation is certainly good, and should meet with attention.

More information may be obtained by letter addressed to Mr. Lawton, at Troy.

CLIMATE AND PRODUCTIONS.

HAVING shown the variety of causes which affect temperature and climate, in previous numbers, we now add a concise view of the productions which belong to each. These facts may be presented in various forms. The shortest and most comprehensive is the following:—

The equatorial zone is the region of palms and bananas.
The tropical, of tree ferns and figs.
The sub-tropical, of myrtles and laurels.
The warm temperate, of evergreen trees.
The cold temperate, of European and deciduous trees.
The sub-arctic, of rhododendrons.
The polar, of alpine plants.

The following statement of the vegetation of different latitudes has been given by good authority:

The northern limit of fine spices,	25°
" sugar-cane and coffee,	30°
" cotton and olives,	40°
" wine grape,	45°
" wheat,	52°
" cultivation,	59°

A more detailed statement is given thus in one of the manuals:

The range of the indigenous or natural growth of maize, Indian corn and tobacco,	40° S. to 50° N.
Sugar-cane and coffee,	30° S. to 30° N.
Rice, cotton, olive, fig, almond, orange and lemon,	37° S. to 40° N.
Cocoa or chocolate nut,	20° S. to 20° N.
Cocoanut, pineapple, guava, banana and tamarind,	23° S. to 23° N.
Ironwood, box, mahogany, &c., dye-woods and palm trees,	23° S. to 24° N.
Cassaya, arrowroot, bread-fruit and yam,	24° S. to 25° N.
Pepper, spices and fine gums,	23° S. to 23° N.
Wine grape,	15° to 40° S.
Barley, apples, pine, &c.,	25° to

Important differences, however, exist in different localities of the same latitude and having the same climate. Thus, in the temperate zones of the Eastern continent, and especially of Middle Europe, the soil is composed of volcanic rocks, which furnish abundance of alkali, and is covered with oaks, elms, beech, ash, larch, maple, lime, alder and sycamore trees—all of which are deciduous, that is, drop their leaves in autumn—mixed occasionally also with fir or pine. The undergrowth consists of wild apple, cherry, yew, holly, hawthorn, broom, furze, wild rose, honeysuckle, clematis, &c.

Farther south, evergreen trees and shrubs become more frequent, while their Flora consists of ilex, oak, cypress, hornbeam, sweet chestnut, laurel,

laurestinus, the apple tribe, manna, jujube, juniper, terebinths and other plants which yield resin and mastic, the arbutus, myrtle, jessamine, &c.

The Malayan peninsula, beyond the Ganges, is the land of dye-woods of vivid hues, of spices and medicinal drugs. Teak is plentiful. Seven species of native oak are found there, as also tamias, cycadeæ, orchideæ, tree ferns, &c. The Palmyra palm grows in the valleys. Bamboos reach a large size.

Similar to the last are the regions of the Indian archipelago, tropical India and Ceylon. Pines, oaks, rhododendrons, magnolias, valerians, honeysuckles, oleanders, gentians, &c., are indigenous. Palm trees are abundant. Jungle and dense pestilential woods abound on the smaller islands and on the coasts of the larger. Mangroves, bamboos, gutta percha and the teak are also found. On the plains of Hindostan we find arborescent and tree-like ferns and orchideous plants. The orange tribe is a native of India, as also the ginger tribes, banana, guava, mango, date, cocoanut, plantain, &c., with cotton, figs, and camphor. Rice is supposed to be indigenous to S. E. Asia.

The vegetation of Western Asia resembles that of India at one extremity and Europe at the other. Syria and Asia Minor, like other countries on the Mediterranean, form a sort of transition region, where the plants of the temperate and tropical regions are united. In Asia Minor are the cherry, almond, oleander, syringa, locust, &c. In Persia, the walnut, peach, melon, cucumber, hyacinth, ranunculus, &c. In Syria, the date, palm, fig, olive, mulberry, damask rose, &c. In Armenia, the vine and apricot; while the last is found every where in Middle and Northern Asia. In the more sheltered regions are the sugar-cane, date, palmetto palms, mimosas, acacias, asclepias gigantea; and on the mountains south of the Black Sea are American types in the rhododendron and azalea pontica.

The vegetation of Eastern Asia, where the soil and climate are less promising, includes thorny bushes, acacias, tamarisks, mimosas, jujube, asafœtida, &c. The Lusanian Mountains are covered with forests of oak. The date palm forms the growth of the parched shores of the Arabian Gulf, and the oäses of the Persian table-land. Plane trees, hawthorns, tree roses, &c., are found in the valleys. Afghanistan produces the seedless pomegranates, acacias, date palms, tamarisks, &c. Teas grow in the Himalayan Mountains. Sweet orange in Japan.

In Africa, south of the Atlas, we find the date palm, which is *cultivated* also in North Africa. In Egypt are acacias, mimosas, cassia, tamarisks, the lotus, the papyrus, &c.

In the islands of Polynesia are the land of the cocoanut tree and of bananas. Fifty varieties of the bread-fruit tree are found there.

All the finer gums and spices are confined to tropical regions. Cloves and nutmegs are confined to the Moluccas, and that species of laurel which produces the true cinnamon is found only in Ceylon. Cocoanuts flourish on the seacoasts of most tropical countries. The tree is a palm, of which there are a thousand species. Dates are another species of palm. The palms produce flour, sugar, milk, oil, flax, salt, thread, utensils, weapons, and habitations.

Of all tropical regions, South America supplies the greatest variety of species. It produces twice as many species as Europe, nearly three times as many as Asia, and more than four times as many as Africa. The grandeur of the Brazilian Flora is no where equalled. Rice grows spontaneously, and maize is raised on the plains even under the equator. The sugar-cane grows luxuriantly only within the tropics, though it is indigenous both in S. E. Asia and in tropical America. The most extensive plantations are in the West Indies and Brazil.

The chocolate nut grows chiefly in South America. The arrowroot is a native of South America, but is cultivated in the West Indies and Ceylon. Peruvian bark is found on the sides of the Andes: more than twenty species are found there. Pineapples grow in Mexico, Guatimala and the West Indies, as they do also in Southern China, and in India. Plantains, guavas and bananas grow in the West Indies, Central America and South America. Also, the tamarind and cassava or manioc root. Tamarinds are also indigenous to India. Vanilla is produced in Mexico and South America. The *strychnus toxicaria*, which yields the deadly worali poison, is found in Guiana.

The catalpa, (which grows spontaneously as far as about lat. 37°,) hibiscus, magnolias, cypress, &c., represent the Flora of Virginia. Cotton comes to maturity as far north as Newcastle county, Delaware. The evergreen pine, maple, red beech, scarlet oak and purple nissa, represent the Middle States. On the Atlantic coast are found the American chestnut and kalmias. West of the Alleghanies are the locust tree, hibiscus, hydrangea, &c. In Canada are vast forests of pines, oaks, ash, hickory, birch, the lofty Canadian poplar, sugar maple, &c., with kalmias, azaleas, asters and solidagos. South of the arctic region are forests of black and white spruce, with an undergrowth of reindeer moss, gooseberries, strawberries, currants, &c. The Flora of Greenland is more arctic than that of Iceland.

The most northern Flora is the Palmetta nivalis, or snow plant, of the polar regions, birches and willows of a few inches in height. Trees are not found beyond 70°, which is also the last trace of antarctic vegetation. Barley grows in the Faroe Islands, near North Cape, lat. 71°. Rye not beyond 67°. Oats are limited to 65°. Potatoes grow under the 69th degree. Norway and Sweden are the only lands within the polar circle susceptible of tillage. At 60° we find the elm, maple, ash, and beech, and wheat in favorable situations. In Siberia, grain will not grow beyond 59°. The remotest tillage in North America, hitherto, is in lat. 54°.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

ACCIDENTS AND RESULTS FROM SMALL BEGINNINGS.

We have been taught by common report that a German gentleman by the name of *Scwartz*, having in some of his experiments in alchemy put into a mortar a mixture of saltpetre and other combustibles, accidentally dropped in a spark, when he was astonished to see the pestle fly off into the air. This incident furnished the idea of making gunpowder, which, coupled with that of its increased power when confined, suggested the propulsion by it of heavy bodies. Hence the use of small and large guns, and a complete revolution in the mode of warfare. The vibration of the lid of a tea-kettle gave the first hint to the expansive power of steam. This small hint, followed up by many practical experiments, finally led to the modern steam engine, which is fast revolutionizing both land and water-carriage, and the propulsion of machinery of every kind. The first idea of our present railways, it is said, originated in quite a simple manner, thus: Laborers engaged in hauling coal from a mine near Newcastle, England, in 1676, to the river Tyne, adopted the plan of laying rails of timber exactly straight and parallel, and heavy carts, with four rollers fitting these rails, were made, whereby the carriage was made so easy that one horse would haul five chaldrons of coal. This simple idea progressed one hundred and fifty years, and resulted in our modern railroad.

The discovery of distillation, it is said, was the accidental discovery of a very humble man, from noticing the working of the slop-pail. Not many years have gone by since a chemist drew across a plank a little stick with which he had been stirring a mixture, when, to his astonishment, the stick, by the friction, ignited into a blaze, and resulted in the modern match. The magnet had been for centuries a mere plaything in Europe. By accident it was freely suspended, and its property of taking a north and south position was noticed. Being subsequently applied to navigation, this resulted in the discovery of America. The power of the sun's rays to discolor certain substances had long been known. Daguerre availed himself of this fact for taking the most perfect and beautiful miniatures, and that in a moment's time. Reports say, the Chinese and others, prior to the year of our Lord 1295, practised the art of engraving with wooden stamps. John Faust, in 1462, invented the present metal types from that idea, printed the Bible, (which had before been copied with the pen,) and sold them in France at 600 crowns a copy. What a stride in expresses, from Volta's weekly package to Morse's Telegraph! Yet this stride is but the application of the simple ideas of galvanism and magnetism, familiar since the days of Franklin. So we might go on *ad infinitum* with the various arts of the age, whilst it must be allowed that agriculture is measurably permitted to

"Sleep mysterious, conquering without force of reason."

The antediluvians, with the aid of Providence, laid the first great principles of agriculture, slowly progressing alike with the increase of population up to the flood, and still onward to the discovery of America by Columbus. Simultaneous with that discovery amongst the natives, here was found the now most important crop of the Western Hemisphere, "*Indian corn.*" This staple production affects every department of agriculture and commerce in nearly every country upon the globe. It entirely governs the price of bread in the Western Hemisphere, and to some extent in Europe. It weighs heavily upon the markets of pork, beef, mutton, &c., not to say whiskey; and yet its origin is found in an Indian hut on the continent, in 1492, suspended upon a pole by the shuck. Wheat, oats, and barley, the other staple breadstuffs, are no doubt indigenous to the old country. The vast quantity which the United States is able to raise of these valuable cereals, would hardly command credence if fairly stated. Its capacity will never be fully known till a demand from abroad shall stimulate their production by a population spread over the lands now vacant. Agriculture is comparatively in embryo. Standing out as the rival for governmental patronage in the union of States, she is merely helped to a few hundred dollars annually through the agency of the Patent Office, whilst she sees Commerce, her handmaid, in receipt of her annual millions, thus alluring the fair youth to her embrace, and employing the rich talent of the continent. "Talent," did I say? Stop: let me see a moment what a farmer intuitively "does know" and ought to know. A farmer is a chemist. He has to combine, separate, modify and change both simples and compounds. His farm is at one and the same time a laboratory and a workshop. A farmer is a botanist, depending upon the vegetable world for subsistence. His labor is among the plants of the earth. He knows the proper name and nature of all trees, shrubs, herbs, and plants. He is versed in zoölogy. Having to contend with animals and insects, he is acquainted with their nature and habits. He works upon and in the soil, changes the state of it, adapts it to various crops. This requires of him to study the components of earth's minerals and fossils found therein.

He is, too, a meteorologist. He watches the clouds and sky, and the probable changes of the weather, and regulates his work accordingly; is acquainted with the components of the atmosphere through all the varied seasons. In this country, too, the farmer contributes largely to the support and formation of the government, and upon him mainly depends the election of ruler and law-maker. Indeed, so wide, so varied is the field of labor to the farmer, that he is unconsciously a learned man, and of right ought to be the most so of all others. Then, brother farmer, take courage, if your beginning shall be even small. Be steady, be firm; read, study, and work, and success is certain. Read, that you may catch the ideas intimated in all the foregoing hints, which have led to such wonderful and powerful results. READ, that you may, by your patronage of good and sound agricultural works, encourage the publication of all improvements. The pursuit of agriculture is no mean employment. The highest, the most magnificent superstructure ever designed by man has its foundation on the earth; and if the grandest monument has not a good foundation permanently set, then is it of little value. Agriculture is the foundation of all arts, of all commerce, of all governments, of all religions. "Work." Yes, brother farmer, here lies the secret of your success. Many would be willing to hold a platter if it should rain pancakes, but the farmer must work, *work*, WORK. In this he fulfils the Divine command that "by the sweat of his brow he shall live;" and if he shall faithfully fulfil that command, he is entitled to and will receive from Providence His blessing on all his efforts. Work, then, that we may have a common claim to Divine benignity.

A. L. B.

Mill Bend, Tennessee, April, 1853.

FREE TRADE TESTED BY FACTS.

IN 1840 and 1841, nearly all our furnaces were closed. Their owners either were ruined, or were driven to abandon a business in which they had invested immense sums of money. During this state of things, the average importation of pig iron was but some 10,000 tons. During the years 1845 and 1846, under a higher tariff, it averaged 20,000 tons, while the produce of our own furnaces was greater than during the former period by more than 600,000 tons.

The export of bar iron in 1840–41, when not a single rolling-mill was in operation in the whole country at which railroad iron could be made, averaged only 40,000 tons. On the other hand, in 1846, when rolling-mills were multiplied, it did not fall below 31,000 tons, notwithstanding the high price which it had attained.

The sales of hardware during these periods equally illustrate our doctrine on this subject. In 1840, but £330,000 were exported to this country under the free-trade doctrines which then prevailed. In 1846, it was £739,000, and this too in the face of a great increase in the domestic manufacture. This is to be explained only on the supposition of a great increase of ability to buy. In 1847, our purchases amounted to £931,000. In 1848 and '49, the average amount was £823,000.

To this abstract we append the following from an exchange, the name of which we have accidentally omitted to preserve:

"REDUCING WAGES.—We see it stated that the proprietors of the two rolling-mills at Norristown have given notice to their workmen that, at the end of four weeks from date of notice, their wages will be reduced."

The above we clip from the *Germantown Telegraph* of Jan. 28. It is a striking commentary upon that Locofoco policy which depresses American labor, which makes England our workshop and Englishmen our workmen. Under the Whig Protective Tariff of 1842, manufactures flourished, agriculture flourished, business of all kinds flourished. Locofocoism saw the prosperity of our country, the proportionate decline in the prosperity of England, and decreed that this should continue no longer. They repealed that tariff and substituted another, under which manufactures have declined, agriculture has declined, and all business affected by a tariff has declined. It has entirely closed many workshops. It has thrown many workmen from employments in which they were skilled, to new employments in which they were not skilled. It has deprived many of them of a comfortable living, and has made many families desolate. Whilst it has rendered manufacturing less profitable, it has lessened the ability of the employer to pay high wages; and it now forces some to make, and others to submit to, a reduction in wages which never would be made, if our legislators would understand and protect the true interests of the country. The wages of the laborer are gradually approaching the "ten cent" standard, which Mr. Buchanan said would "cover the land with blessings and benefits." We hope the experiment may never be carried out. We do not wish to see the misery that system would inflict upon American freemen. But should Congress remain regardless of its duty and our wants, we hope to see our laboring population, our entire business community, and every man who has a wish for the prosperity and independence of the country, to rise and rebuke the political traitors who placed this incubus upon us, in direct violation of pledges which honest men would have considered too sacred to be broken.

IRON—HOW MADE MALLEABLE.

A CORRESPONDENT sends us the following inquiry: "How is iron made malleable?"

We are happy to gratify our friend, and we hope many other readers, with the following reply:

Iron is never found pure in a native state. We have personally examined a multitude of specimens of iron ore, but have never seen those from different ore beds that did not differ, in some feature, from all others. It occurs in granular form, mingled with various other substances, and also in regular crystals, which are often magnetic. Some that we have seen—specimens of which we obtained at the mines in "Peru," as the township is called, and which borders on Lake Champlain—contains about 80 per cent. of pure iron. This is granular. The crystalline form also occurs there, of which we also have specimens, but we cannot now state its value. It should, however, be observed, that what is usually regarded as granular is said to be crystalline under a powerful microscope, being composed of crystals of an octahedral (eight-sided) form, of various sizes, the largest being only one fifteen-thousandth of an inch in linear dimension, while many are very much smaller. Sometimes the crystals are six-sided, and these reflect a whiter color, the result, probably, of the arrangement of their particles, which is *stellar* or *radiated*.

The specific gravity of crude iron is about 7, (water being 1,) while malleable iron is a fraction greater. The weight of iron may be estimated, with tolerable accuracy, at a quarter of a pound for a cubic inch.

Iron possesses great cohesive properties. In this it is superior to any other metal, when drawn into wire. Counting iron (in its cohesive power) as 1, copper is .587, platinum .5, silver .342, gold .273, zinc .2, tin .064, and lead .051.

A native ore of carbonate of iron, or steel ore, is also found, though very rare. One locality we have examined in Vermont, in Windsor county, the only one of which we have knowledge on this continent. It yields steel at "its first treatment."

In the manufacture of iron, the first process is called smelting. This is the work of a furnace, and the product is crude iron. The founding or re-melting of this crude iron (the business of a foundry) produces cast iron; and the refining of crude or cast iron gives us malleable or bar iron. The last is the work of the forge or rolling-mill.

In smelting, fluxes are used,—lime being almost always employed, though for reducing calcareous ores, aluminous or magnesian earths are most suitable. The results are *pigs*, *sows*, or *runners*, according to the size of the moulds.

The natural result of heating a metal in contact with the atmosphere is to produce an oxide. The action of heat favors the combination of the metal with oxygen; but in forging, the object is the reverse of this. The native ore, or the pig already passed through the furnace, is to be made still more pure by the separation of oxygen, and perhaps other elements. This is effected by keeping in view two objects: one, a proper construction of the oven, and the other the selection and application of a suitable fuel which shall evolve sufficient carbon, with the aid of a proper form in the oven, just referred to, to prevent the too abundant contact of oxygen, and, at the same time, guard against an excess of carbon.

AFRICA.—PRODUCTIONS AND TRADE.

We know almost as little of Africa as the Africans do of us. Now and then we get a new and valuable report of the condition of things in that country, but nevertheless the sum total of information is, with most of us, very small. An article on this country, in a late number of *Frazer's Magazine*, contains much that is of interest, and we abstract from it the following statements in relation to the condition of the arts, manufactures, &c., and the trade which is based upon them.

The inland states of Ethiopia, more especially those of the Manding race, enjoy a supremacy in the manufacture and ornament of leather. So also in the peculiar construction and patterns of some cotton fabrics, and embroidery in silk and wool, horse-trappings, mats, carpets, water-proof garments, tobes, or outer tunics or shirts with wide sleeves, chiefly worn in the Mohammedan countries of Soudan.

Their leather is as much esteemed and as costly as Russia leather is with us.

Gold, ivory, musk, korkodan, or the horns of the rhinoceros, are in sufficient demand to allure to Ethiopia many strangers.

In certain fabrics they surpass others. "No European nation has yet succeeded in imitating" them. The Turkish cap, or fez, the best of which are made in Tunis, is an example. The temper given to steel, especially among the Duaric tribes of the Sahra, is believed, in those countries, to rival that for which Damascus was amed. Woollen garments, of certain peculiar textures, would at least bear comparison with the best of their kind manufactured by

any other people. In the manufacture of perfumes they also excel. Much invention and ingenuity are shown in the chasing both of gold and silver. done at Tarudant, Morocco, Rudana, Fez, Tunis, &c. The soap of Susa is highly and deservedly esteemed in the Levant. The snuff of Baja, in Tunis, is of great repute; so is the tobacco of this and some other growths, as of the Zawan and the Matamata. Wools, admitted to be of the finest merino texture, are brought from Cassa, Tozar, Nafta, and the country of the Mezzab, south of the main Atlas of Algiers. It is used by the Persians and other manufacturers in their finest shawls and other fabrics.

Dates.—The finest dates in Africa, or perhaps in the world, grow in various parts of the Jerreid, and are known by various names, of which Diglah and Horrar are the principal.

Olives.—The extensive olive forests or orchards of Tunis proper, supply the fruit from which the purest and most tasteless oil is extracted by the Darbel maa or cold-water process; though it is generally obtained through France or Italy, where it is adulterated with oil of inferior quality.

The country of Grenna, the Cyrenaica, is celebrated for butter, honey, wax and coarse wools, for chairs and mattresses. Various parts of Barbary produce the best qualities of hemp, flax, pitch and tar, coarse sponge, madder, saffron, sago, cummin, caraway and other seeds, hides, calf, goat and sheep skins, gums, feathers, &c. Sulphur exists in Barcas, the Syrtis Major, in profuse abundance.

Cotton has been raised successfully in some of the valleys whose soils are fitted for this plant. That of Gaba, and of the islands of Gerba and Kerkeni, at the extremities of the Minor Syrtis Gulf, would admit of cultivation to a vast extent.

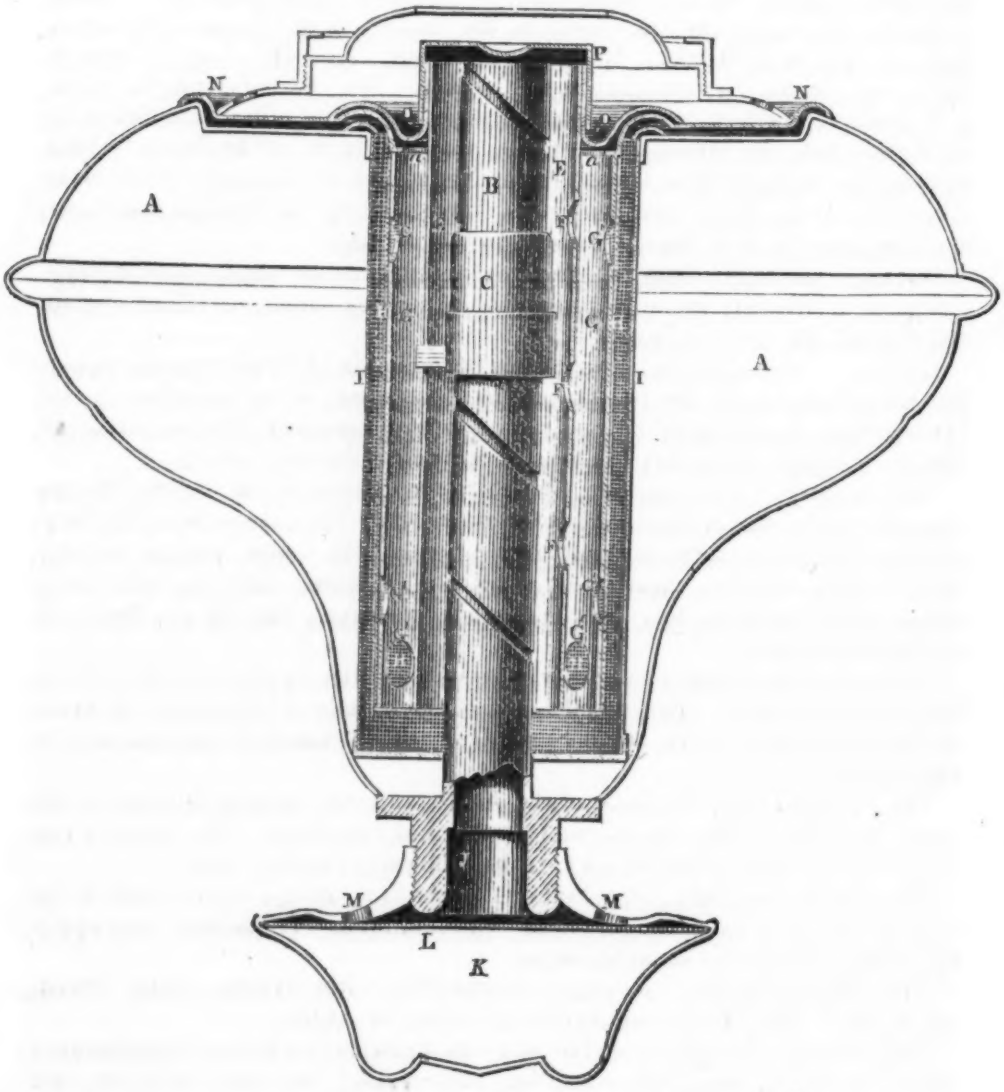
The pistachio tree, the fustic of the Arabs, and the banana, flourish in the same localities. The almond and the fig are excellent. The latter is the chief winter food of the Beraber Arabs, who have not the date.

The whole coast from Cape Vada to Gerba is a fishery, where beds in the sea, separated by palm boughs, form the inheritance of families, and supply the principal food of the inhabitants.

The Mohammedans exchange commodities with Arabia, Syria, Persia, India, &c. The Arab is the wholesale pedlar for Africa.

The articles of import to Barbary are principally British manufactured cloths of cotton, linen and wool, fine and coarse; bar iron, steel, tin and copper in plates, nails, cutlery, brass pans; earthenware, china cups and glassware, mirrors; copperas, arsenic, alum, lead; silk, taffeta, damask, velvet and brocades; spices, refined sugar, tea, coffee; India cottons, white and blue, (the latter for the tribes of the Sahra;) rice, and other things adapted to the respective countries of Barbary. The consumption of tea is, however, principally confined to Morocco, coffee being the beverage of the towns east of that empire, as far as the limits of Africa extend.

In tropical Africa, on the Atlantic shores, a sort of desultory trade, often conducted on the barter principle from town to town, among races not Mussulmen but pagans, the imports are rum, cowries, beads, trinkets, white and blue cotton cloths, coarse woollen and linen goods, firearms and gunpowder, lead, tobacco, brass pans, sugar, silver, galloon, cutlery, needles, paper, thread, plush and velvet, earthenware, bottles, cheap looking-glasses, gin in cases, silk in thread, &c.; to which may be added old clothes, especially those of footmen and beadles. For these the natives give their gold dust, ivory, dyeing woods, gums, drugs, aromatic seeds, wax, honey, palm oil, bullocks' hides, cassava, yams, and other provisions, or slaves, if they are wanted.



NEWELL'S WIRE-GAUZE LAMP.

THE annexed engraving is a vertical section of Newell's Wire-Gauze Lamp for burning volatile hydro-carbon fluid. It has the wire-gauze safety arrangement which we described in a late number, on the principle of Sir Humphry Davy's Safety-Lamp. It may be had of Newell & Co., Winter street, Boston, or G. W. Macready, 426 Broadway, New-York. It is similar to the common table globe-lamps, and is designed to be set on a table, or into a socket, and to be hung on a branch to the wall, with a reflector behind it.

A is the inside of the lamp for containing the fluid; B is the common screw tube, over which the circular wick-thimble, C, is placed as in the common argand lamp. There is a cylinder of wire-gauze around the tube E, inside of tube G, which fits like a sleeve over tube E, as shown at H H. The fluid is poured in at the top through a number of holes, *a*, in a circle. The fluid finds its way into the body of the lamp through the openings G′ G′, and it is fed to the wick through the small openings F F in the tube E. There is a wire-gauze cylinder, I I, fixed to the body of the lamp surround-

ing the tubes and the tube gauze-cylinder spoken of. The air to supply combustion passes through openings, M M, and up through tube J. If any fluid is drawn up with the wick, it passes down the interior air-tube into the small chamber, K, at the bottom, L, of the lamp. O is a cap to cover up the ring of holes, through which the fluid is poured into the lamp. P is an extinguisher-cap, which also prevents the evaporation of the fluid when the lamp is not used; it covers the wick perfectly tight. N is the top piece common to all lamps which employ chimneys and a globe.

The wire-gauze prevents explosions, even although the fluid inside may have passed into a gaseous state.

SHOVELDOM.

EVERY BODY who ever used a shovel in America, must have known something of O. Ames & Sons' shovels, Easton, Mass. The following description of the *method* of this establishment will be read with interest:

In the first place, by a knife of irresistible edge, as it obeys the irresistible force of the "water-power," a plate of the right size is cut from a sheet of steel as if it were a sheet of silk before the scimitar of Saladin. Two more similar clips from two similar knives give the right outline for the shovel. To remove the "black scale," the plate is ground on a grindstone; then it is punched for the rivets which are to hold the back and front straps to the blade; then, after having been heated, its surface is shaped by pressure between two dies with a weight of about 1200 pounds. Next comes the "setting," done by hand, to remove "wakes," straighten sides and correct twists. A vitriol bath to remove scales, and a vigorous polishing on wheels covered with emery, dismisses the plate for the present, and leaves us at liberty to prepare the "straps" needed to bind it to the handle. These are cut, rolled, sheared, pounded, levelled, shaped, annealed, polished, countersunk, &c., mostly by ingenious machinery, and then they are riveted to the front and back of the shovel, close as you see them, fitting like a glove that fits as a well-behaved glove should.

We move on now to the handle-shop. The two holes for rivets in the head of the handle are bored at once, by bits revolting two thousand times a minute. The "bending" to give the graceful curve and right balance for easy working, is an amusing operation. The lower end is boiled for an hour or two, to take the obstinacy out of it and make it pliable. When it is soft enough to be docile and manageable, it is placed between two iron blocks, with the rightly undulating grooves, and connected by a hinge, as a lemon is put into a squeezer; and then the blocks are brought together by a powerful pressure and fastened, and so the prisoner is kept encased until he grows cool, and promises never again to straighten himself out. With this understanding he is released and put away for three weeks to dry, and get thoroughly seasoned for the laborious life before him. How the caps to the rivets and the rivets themselves are made; how the handle is inserted between the straps, and screwed and wedged; how all rough edges are filed down, and wood and iron rendered agreeable to the hand; how the plate is scoured, and all metal parts of the tool burnished; and the shovel complete is made bright, clean, and trig, ready for inspection—we have neither time, room, nor descriptive power to tell. Suffice it to say, that such facility and perfection have been attained in the manufacture of the respective parts, and such the number of persons employed, that on the average a shovel is made now in less time than

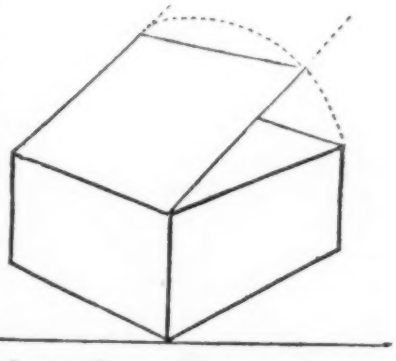
it once took to bore the holes through the head of the handle. Experiment and ingenuity and industry have achieved this really marvellous result in this model establishment, whose name and fame are such, that it has not been able for years to fill all its orders or to supply the demand for its products. This success is greatly due to strict observance of these principles, viz.: 1, that the labor shall be divided into as many distinct processes as possible; 2, that each man shall learn but one process, and learn that thoroughly; 3, that each workman shall be paid so much per dozen for his work—so, if indolent, he shall be the loser, and if industrious, the gainer; 4, that the shovels shall be inspected at every stage of their manufacture, and when they are finished, in order to guard against poor work; and 5, that none but the very best materials shall be used.

Of the statistics of "Shoveldom" it is enough to say—omitting all reference to its indirect effects—that it uses each day 4 tons of iron and 2 tons of cast steel; it employs 250 men, paying them from $5000 to $6000 per month in wages; turns out more than 2000 shovels of various styles and prices per day; and sold last year something like $600,000 worth of its fabrics. In view of these figures, were we not right in designating "Shoveldom" as a kingdom? And who will deny that its liberal-minded, intelligent, and enterprising proprietors have been and are, in the way of business, benefactors to the community, by furnishing employment to so many operatives, creating as it were a thriving town, and equipping armies for the peaceful physical conquests of the times? No one certainly who has visited their establishment.

PERSPECTIVE DRAWING.

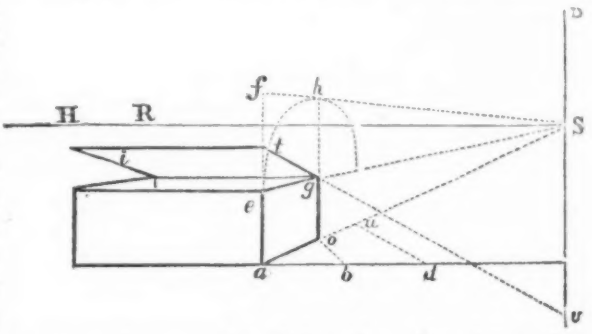
HAVING briefly illustrated the process of determining the length and direction of lines parallel or perpendicular to the line of the horizon, we next come to those which are oblique. The lid of a box, partially opened, the roof a house, may serve as illustrations. Trap-doors and many other familiar objects may come under the same class. Oblique lines must terminate either on the horizon, or on a point in the vertical drawn through the horizon.

Thus, the cover of the box in the margin may be in any plane that can be drawn in a semicircle, or even in a larger arc, but the parallel lines forming its opposite margins must meet in the same point of the vertical. In this diagram, the vanishing-points and the vertical drawn through one of them are too far distant to be included in the figure.



Sometimes two verticals are required; as if a box should consist of two parts, with covers on each, hinged at its centre. It is obvious that these points in the vertical may be at different elevations, since one cover may be represented as more open than the other. They may also be either above or below the horizon, according to the position of the cover, and also the position of the hinge, whether from or towards the line of the horizon.

The mode of drawing such diagrams is as follows: Set off the width of the box from *a* to *b*, and rule to R, the radial point in the horizon H S. The point of intersection with a line from *a* to S gives the perspective width. From *a*, set off the height of the box, and rule towards S for its upper margin. A perpendicular may then be drawn for the rear of the box, the whole of which may now be completed by the rules heretofore given. For the cover, the depth of the box may be set off above its upper margin, on *a e* produced, and this point connected with S. The point *h* will then give its width when in a vertical position; and by drawing a perspective semicircle from the point *g*, as a centre, through this point, its width, in any position, will be exactly ascertained. Whatever position is chosen for it, continue the line representing it to the prime vertical, as at *v*, and by a rule from *v* to the opposite end of the cover, its opposite side will be fixed. The only remaining line must be drawn parallel to the top of the box, or, if oblique, it must be drawn to the vanishing-point from which the lines parallel to it were drawn.



But one other point needs to be exhibited, for the convenient and successful application of this science to practice, in the plain way referred to in the commencement of this series. We may be more full hereafter on the same points, and introduce others of great convenience, and even essential for some of the styles of perspective drawing. But all plain rectangular diagrams, representing buildings, streets, &c., require the application of no other principle than those embraced in the foregoing, save that which we now attempt to explain.

PERSPECTIVE CIRCLES are among the most difficult of all the operations of the young student. They are neither circles, nor ellipses, nor ovals, as these terms are usually understood, but partake of the characters of all these. A circle is easily described within a square. But in a perspective square, the width of the square is constantly diminishing, the narrower part being towards the horizon. Hence the circle must be contracted in like manner. Perhaps the simplest process for drawing the circle is this: Draw a mathematical square of the required dimensions, and inscribe a circle within it. Next, draw two, three, or more diameters, at pleasure, and then, by the rule given in our May number, page 270, transfer the points forming the extremities of these diameters to the perspective square, and unite them by a proper curve. This will require some practice, but facility of execution will by and by be acquired, and two diameters will then be enough as guides in forming the entire curve. To prevent a multiplicity of lines, the diameters may be drawn with a pencil, one at a time, and the points being fixed, one line may be rubbed out and another drawn, and so on, and all confusion will be avoided.

ELECTRIC TELEGRAPHS IN INDIA.

A LATE number of the New-York *Commercial Advertiser* contains an interesting account of some experimental telegraphic lines in India, and of an ex-

tended system of telegraphing about to be introduced into that country. It seems that Dr. O'Shaughnessy, of the Calcutta Mint, having been authorized by the Governor-General to make some experiments in telegraphing, constructed a line 82 miles long, involving some extensive river crossings, which is found to work so admirably as to induce the East India Company to contract for some 3,150 miles of the telegraphic communication, connecting the three presidencies of Calcutta, Bombay, and Madras.

Dr. O'Shaughnessy's plan is quite different from that used by any telegraphing company. Instead of wires, he uses iron rods three eighths of an inch in diameter, and weighing a ton to the mile. These rods are welded together and supported on bamboo sticks, which yield freely to the wind, bending, but not breaking before the tempest. The cost of the rods and the welding is about £12 10s. a mile; and as no insulators, winders, or other apparatus is required, it is said to be cheaper in the end than wire lines, which are very apt to get out of order. The severest hurricanes have not, thus far, damaged this experimental line, while wires have been found broken after every storm. The telegraphing instruments employed are of the simplest kind, consisting of a single-needle horizontal telegraph, which is found to work in all weathers, and to be easily repaired by the operators. A battery of 12 to 20 pieces of platinum wire, with zinc plates, suffices, it is also said, to work the lines through the heaviest rains and most violent storms. The cost of a set of instruments of every kind is under £10, and the outlay for the construction of the lines, independently of river crossings, will be £35 per mile for a single, and £55 for a double communication. In crossing streams, a gutta percha-covered wire, laid in the angles of a chain cable, is employed.

WORK FOR JUNE.

By this time the industrious farmer will have finished all his "spring work," and his planting of the staple crops. This process will have exhausted all his manure-beds, and left a void in the prospect before him which nothing else can fill. Hence it becomes him, in the short leisure time between planting and hoeing, to commence the process of renewing those piles, the farmer's only mines of wealth. Throw all the accessible refuse into one pile, and sprinkle it freely with charcoal dust or plaster of Paris, or both, with an occasional supply of cheap salt. Call the daily litter and dirt of the hog-pen into requisition, and from time to time add all the swamp-muck, broken peat, all the waste water of the cook and washerwoman, ashes, &c., and above all, the slops of the chambermaid, and you will secure the means of a valuable harvest for another year. Every man is said to be the maker of his own fortune, and it is most emphatically true that every man is the fertilizer of his own farm. It rests with him whether it shall be a shallow, exhausted, drained, famished soil, or a deep, fertile, profitable one. All soils cannot be made equally rich, but there are very few that cannot be made paying farms.

A top-dressing of plaster of Paris, sprinkled in the drills or rows, or of guano and charcoal dust, well mixed, will be of service in hastening forward your crops.

Cucumbers, melons, &c., may still be planted. Dig large and deep holes, fill with rich mould, or earth and manure, and arrange your seeds in the most economical manner, giving them space to run outwards.

It is not too late, however, for planting many sorts of crops for daily use or for the market. Potatoes may still be planted, and a variety of root crops, as carrots, beets, ruta-bagas, &c. Buckwheat may be sown later than this. As a general rule, however, seeds that are sown late in the season, or after a powerful sun scorches the surface of the soil, should be covered more thoroughly than those planted earlier in the season. Beans, peas, and various fruits, may be planted from time to time, and a constant supply kept up for table or for market.

SHEEP-SHEARING is the work of June. We have lately seen a mode of accomplishing the washing of sheep, preparatory to shearing, with a very trifling exposure of the person to the water. It is by sinking a half hogshead, or more, in the water, having it of such a height that the top of the tub shall rise a little above the surface of the water. The washer stands in this tub or hogshead, and is essentially protected from the water. As a general rule, however, we would recommend "to take the bull by the horns;" to plunge in with the patient animal you would cleanse, and make common cause with him. It is only invalids, or those who have peculiar reasons for caution in the matter of personal exposure, to whom we would recommend such measures.

It is far more important, during the cold storms that sometimes prevail after the sheep is deprived of his natural clothing, to shelter them from those protracted exposures which may result in disease and death. During the summer they should also be constantly supplied with salt. There is no danger of their eating it to excess if it is kept within their reach.

THE FLOWER-GARDEN will now begin to reward the early laborer. Take up your bulbs which have flowered, dry them carefully, and lay them away in drawers. The crocus and iris do not require this oftener than in alternate years, and jonquils once in three years. Flowers that are near blooming should be well watered. Limit the supply when they begin to open, and they will last longer. An excess of water, however, at any time, leads to large growths of stems and leaves, and to diminish both the quantity and beauty of the flowers.

WHAT TWO ACRES CAN DO.

THE twenty-sixth meeting of the Germantown (near Philadelphia) Farmers' Club was held at the house of Philip R. Freas, on the 23d of November. He is the editor of the *Germantown Telegraph*, a warm and active friend of agriculture, horticulture, etc., and the originator of the Club. Though his whole plot of ground comprises less than two acres and a half, yet he manages to produce upon it, in perfection, a little of every thing. Those who are sighing for more land will do well to read his statement carefully, and inquire whether it would not be wiser to cultivate their present acres better, than to add to their number. The reporter at the meeting states that during the present year there were cut two tons and a quarter of prime hay; there were patches of turnips, carrots, parsneps, beets, cabbages, (three kinds,) onions, peas, frejole, and half a dozen of other kinds of beans; salsify, lettuce, okra, corn, (Stowell's Sugar, and Adams,) potatoes, pumpkins, (three varieties,) squashes and tomatoes, egg-plants, asparagus in abundance, celery (of splendid quality,) together with every other kind of vegetable to be found in the catalogue. His fruits consist of melons, six kinds of cherries, five kinds of

plums, peaches; twenty-eight varieties of select pears; twelve varieties of apples; red, white, and black currants, gooseberries, blackberries, and four varieties of raspberries, grapes, &c.

In the garden and mansion yard, there was a very choice collection of flowers, among them many select roses and rare vines. The ornamental trees consist of five varieties of the fir; the Japonica cryptomeria, the Deodar cedar, the Irish yew, and the American arbor vitæ; the European linden, the sugar and silver maples, the English and mountain ash, &c. In addition to these, there was a number of beautiful Polish fowls—black, white and spangled—and pea-fowls in the barn-yard; a fish-pond in the garden, and a large number of choice fancy pigeons at the house. In all this there is an excellent taste displayed. We noticed that the house and offices were lighted with gas, warmed with a heater, and supplied with water from the public works. Baths, hot and cold, have for years been supplied by a reservoir on an elevated back building, holding some fifteen hundred gallons, which has also furnished pure soft rain water for various parts of the building.

In the garden is a small green-house, excavated in the ground, say to the depth of three or four feet, framed up at the sides, raised a couple of feet above ground, and covered with glass. In this enclosure or pit, the usual shelves are arranged to receive the pots; and we are assured by Major Freas that it is the best possible provision for flowers and almost every description of plants in winter. Roses, particularly, flourish in much greater perfection During the whole of the last unusually severe winter, but a single delicate, night-blooming jessamine was at all injured by the frost. This green-house requires no artificial heat. In the hot-beds we found cucumbers and cauliflowers up, lettuce heading, and spring radishes full grown. We may truly say in regard to the "Telegraph Farm," that it is a farm in miniature; but in comfort, convenience and taste, without any large pretension to more costly elegance, it is a "pattern plantation," and would, in the full-growing season, afford compensation for a visit from any of our ponderous farmers. In a word, it is, in the strict sense of the word, a home.—*Peekskill Republican.*

SUGAR CULTURE.

We find in the March issue of *De Bow's Review* an interesting article, entitled, "Extension of the Sugar Region of the United States," written by Dr. Cartwright, of New-Orleans. The Doctor has devoted much time to the investigation of the subject of sugar culture, and has come to the conclusion that the sugar region proper extends much farther north than is generally supposed. A false theory in regard to climate has limited the culture in the United States mostly to the 30th parallel of latitude. But one fact is worth many theories—1000 hhds. of sugar were made in 1851 on a plantation the farthest north of any other sugar estate in America, and this sugar, the Doctor is credibly informed, brought a better price, and the molasses sold for two cents per gallon above any in the market. This plantation lies in latitude 31½°. The farther north the cane-plant can be made to grow and mature its juice, continues the Doctor, the better will be the sugar and the higher its value; for cold nights and hot days, it is said, have a favorable effect upon the cane, preparing the liquid sugar in it to mature sooner and better, and to crystallize, when defecated, in firmer, harder and drier grains than it does in

tropical climates. Every sugar-broker in New-Orleans is apprised of the fact that Louisiana sugar is far superior to that made in the West India Islands.

Dr. Cartwright presents an array of statistics, proving that Louisiana is far ahead of either Cuba or Mexico in the amount of product per acre. Upon the authority of Humboldt, he states the yield in the former to be about 2800 pounds per hectare, (two and a half acres,) and in the latter 2600 pounds. Several cases are cited where, in Louisiana, 7,500, 10,000 and 11,775 pounds per hectare have been produced. The impression has been that, in consequence of superior machinery, a given amount of cane in Louisiana produces more juice than in Cuba. It is stated that five experiments have been made in St. James, Louisiana, and that 10,000 pounds of cane gave 63 to 64 per cent. of juice; whereas, of three experiments in Cuba, the yield was 35, 45 and 57 per cent. It therefore appears that Louisiana cane is from 10 to 20 per cent. richer in juice than that of Cuba.

In regard to the extension of the culture northward, Dr. Cartwright says, that for more than twenty years, P. M. Lapice has grown excellent cane near Natchez, in 31½ deg. It has also for many years been found to succeed very well on Lake St. Joseph, north of 32 deg. It grows well also in the vicinity of Monroe, on the Washita, 32½ deg. The Doctor has been credibly informed that there is no finer-looking sugar cane any where to be found than in Marshall county, Miss., near Holly Springs, but a little below the 30th parallel of latitude.

We have long been satisfied ourselves that sugar might be profitably cultivated considerably north of what is considered the sugar region proper of Louisiana. Some twenty years ago, we had the sugar mania in Alabama, which pervaded the entire southern portion of the State to an extent greater, perhaps, than the morus multicaulis fever. We saw fine-looking cane growing in Dallas, Greene, and Tuscaloosa counties. The cane in size and quality was, we believe, entirely satisfactory, but it was the fewest number who possessed the knowledge of converting it into sugar and molasses, and none had provided any but the rudest means for crushing the cane and boiling the juice. So the idea of sugar-making was dropped, the only fact demonstrated being that the cane would grow luxuriantly and of good size.

A few years since, Colonel Jeremiah Austill made an experiment at sugar culture, though on a limited scale, in Clarke county. His plantation is in about 32 deg. north. The cane was superior, and although his machinery was of the rudest kind, he made several barrels of excellent sugar. He was fully satisfied that he could produce sugar there, equal to the best Louisiana, to an extent that would be far more profitable than cotton-planting. But the Colonel contracted the California fever, and nothing could restrain him from a visit to the diggings. We are not informed whether, since his return, he has resumed sugar-making. There are large bodies of lands on the Alabama, Tombecbee and Mobile rivers, every way adapted to the culture of the sugar cane. But whether any of the present generation of our planters have the enterprise to convert them into sugar estates is a question that time must settle.

It has long been ascertained, it is said, that at a very small expense of time and trouble, in latitudes below 35 deg., the cane tops can be so arranged over the ratoons as to protect them from the hardest frosts. There is also, remarks the Doctor, a recently discovered scientific truth, which has an important bearing on the practicability of greatly extending the profitable culture of the cane in a northern direction. It is, that the sugar in cane juice is a *vital* product, or at least subject to the same laws as fibrin and other vital

products of this kind. The saccharine matter, in other fruits, is produced by chemical affinities, and not by vital action; whereas that contained in the cane is formed by vital laws, as muscle is, and not by chemical agency, as in other plants. This vital product called cane sugar is found to rotate the plane of polarization of polarized light to the right, whereas the solutions of the chemical sugars rotate to the left. The Doctor has proved by direct experiment, that fresh cane juice is death and destruction to certain animalculæ.

We often hear, says Dr. C., of hard frosts injuring the cane. But it is not the frost or cold weather, but the warm weather after the frost. The hardest freeze will not hurt ripe cane, provided it be ground before a thaw and immediately converted into sugar. In this it resembles the flesh of slaughtered animals.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

GAPES IN CHICKENS.

NEAR IOWA CITY, April 21st, 1853.

MESSRS. EDITORS:—In the April number of your excellent paper I saw a request made by "*Inquisitor*" from Nashville, for information, among other things, as to the cause and cure of gapes in chickens. I am willing to contribute my mite to those engaged in raising poultry.

I propose from thirty years' experience to give the *cause* and *preventive* of gapes. The cause is found in the habit of keeping male chickens from year to year in the same flock of hens. Their successors are selected from the same flock, until the chickens become feeble, and one of the sad effects is the gapes. To effectually prevent their occurrence, let Mr. Inquisitor select males from a flock from which there have not been any crosses. Having removed all of his own, repeat this every year; and my word for it, he will not need a cure for gapes. The same is true of turkeys. If this is deemed worthy of a place in your paper, I will send you a communication on another subject.

JESSE HIGBEE.

Will you, or some of your readers, favor me with a recipe for making vinegar by the use of acetic acid? What other ingredients are used, and how proportioned; what the quantities for a barrel, &c.? J. H.

HOW TO MAKE MANURE.

THE Massachusetts Agricultural Society's Report gives the following statement from a farmer of Hampshire county, of that State:—"Immediately after planting in the spring, and after I have used what manure I want, I commence my compost-heap for the next season. Into a convenient place, which with me is a hollow in the angle of a bank-wall on the south end of my buildings, I deposit first a load of horse-manure. Over this I usually spread the scrapings of my wood-yard cellar, especially in May, and all other substances that will make manure that I find about my buildings; such as the rakings of the yard, old leaves, &c., making in all another small load. Over this I add a load of loam; then over the whole I spread about a bushel of ashes. For the next three or four weeks this heap receives from the wash-room all the soap-suds and washing-water, and from the house all the useless slops and washings of the kitchen, sweepings, &c., being kept continually moist. In about four weeks after the first deposit, I add another load of horse-manure, more loam, and sand from the washing of road drains spread

over the horse-manure; and over all a layer of wood ashes, occasionally adding more during the next four weeks. This heap, for the succeeding four weeks, receives as before all the fertilizing substances that accumulate in the wash-room and kitchen. This process is continued during the summer and fall until snow covers the ground; then I call my heap finished, only as it continues to receive during the winter washings, slops, &c.

"I claim for this manure the following advantages: First, it is cheap. Horse-manure, *alone*, is a miserable fertilizer; and this, excepting the wood-ashes, is the only substance of any value that enters into the composition. Combined in the way stated, it helps to form a valuable manure. Again, as a matter of cleanliness and convenience, this compost heap is of great advantage. How often do we see about farmhouses and farmyards accumulations of substances, rendering the premises filthy and unsightly! The compost-heap receives all these otherwise useless accumulations."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

SCOURS.

MESSRS. EDITORS:—As the season has arrived when old cows and young calves and horses and colts will suffer severely with the scours, I desire, for the sake of the poor animals, as well as their owners, to circulate a very simple as well as an infallible cure for that disease, which, though not very often fatal, is the cause of considerable loss to farmers, and particularly to the large graziers in some parts of the West. The cure is simply to rub a table-spoonful of hog's lard over the kidneys. Rub it in tolerably well and by the time you are done rubbing, the cure will be effected. I have effected many cures, and never failed: one, a calf that could not stand up, was walking about an hour afterwards.

I think it proper to communicate this, for although not original with me, I have never seen a person who had heard of it except my informant, some fifteen years since. I have known it applied in a hundred cases, some of which must soon have terminated in death, and the cure, in every instance, was immediate and permanent. J. A. B.

Washington, D. C., April 27, 1853.

APPLE TREES.

THE experience of Mr. Pell, of Ulster county, N. Y., is invaluable as to the management of apple trees, and cannot be too often repeated. The following is from that gentleman:

"For some years I have been experimenting upon the apple tree. Having an orchard of 20,000 Newtown Pippin apple trees, I have found it very unprofitable to wait for what is termed the bearing year, and consequently it has been my study to assist nature, so as to enable the trees to bear every year. I have noticed that the Newtown Pippin bears more profusely than any other kind, and consequently requires the intermediate year to recover itself by extracting from the atmosphere and earth the requisites to enable it to produce. If unassisted by art, the intervening year must necessarily be lost. If, however, it is supplied with the proper sustenance, it will bear every year.

"Three years ago, in April, I scraped all the rough bark off a few of the apple trees in my orchard, and washed the trunks and limbs within reach

with soft-soap; trimmed out all the branches that crossed each other, early in June, and painted the wounded part with white lead, to keep out the moisture; then split open the bark, by running a sharp-pointed knife from the first set of limbs, in the latter part of the same month, which prevents the tree from becoming bark-bound, and gives the inner wood an opportunity of expanding. In July, I placed one peck of oyster-shell lime around each tree, and left it piled about the trunk until November, when I dug the lime in thoroughly. The following year, I collected from those trees 1700 barrels of fruit, some of which was sold at New-York for $4, and the balance in London at $9 per barrel. Strange as it may appear, they are now (1844) literally bending to the ground with the finest fruit I ever saw, a specimen of which is before you. The other trees in my orchard, not treated as above, are barren, next year being their bearing year."

THE CONSOLIDATION.

"THE following is the basis for the stocks of the different companies that have united under the bill for the consolidation of the Western Railroads:

	Stock.	Original Cost.	Cost, adding prem. on Stock.	
1. Albany,	$1,000,000	$1,775,000	$1,892,000 . .	117 pr. ct.
2. Utica, 2 Roads,	6,300,000	5,893,000	9,358,000 . .	155 . .
3. Syracuse, 2 do,	3,000,000	3,261,000	4,761,000 . .	150 . .
4. Rochester,	5,550,000	6,017,000	7,682,000 . .	130 . .
5. Buffalo,	1,825,000	2,415,000	3,145,000 . .	140 . .
6. Lockp't, 2 R'ds,	2,350,000	3,058,000	3,635,000 . .	125 . .
7. Troy,	650,000	650,000	650,000 . .	. .
Total,	$20,675,000	$23,069,000	$31,123,000 . .	136½ p. c.

"Thus, the management, salaries, office expenses, etc., of ten companies, are brought under one head, and consequently a great reduction will be made, and the public are assured a more speedy and effective transit."

The above paragraph, with some variations, is going the round of our exchanges, with an expressed or implied approval of it in all its particulars. But for ourselves, while we approve the policy of union, it is on entirely opposite grounds from the first named. The idea of saving cost in the *management* is or should be an obsolete idea, after the tragedies of the last months. Better men must be had, and at higher rates of compensation, and the number of agents must be essentially increased. This grand corporation, for example, requires one great, far-seeing, comprehensive mind, who will discover any point on which there is danger to life or limb. This one mind is above and over all now in office, and will demand the highest salary, so as to secure the best man. The gentlemen now in office, under a change of name, if you please, must still be on the watch-tower. Their subalterns must be there too, and, like those on the Hudson Road, never so remote from each other as not to be in plain view, forming an unbroken chain of watchmen; not minute-men, but mile-men or half-mile men. We allude now to roads or sections which have only single tracks. Then there will be dividends, for the public, feeling that they can be safe, will travel by steam. There will be dividends also, because every man will do his duty, conscious that eyes are on the alert, and that he is fully exposed to the observation, both of his co-laborers and of the public. Gentlemen, go on with the union, for it strengthens THE Union; but not to save a sixpence—rather to save life, and promote the ultimate interest, not only of stockholders, but also of the people.

SADDLE OR GIG HORSE.

An expert publishes the following as some of the prominent points of this noble animal, designed for the uses specified: A moderately small head, free from fleshiness; fine muzzle and expansive nostrils; broad at the throat and wide between the eyes, which denotes intelligence and courage; a dished face indicates high breeding, and sometimes viciousness; a convex or Roman nose frequently betokens the reverse; the ears rather long, yet so finely formed as to appear small, and playing quickly like those of a deer; the eyes clear, full, and confident, with a steady forward look. Glancing them backward or askance with a sinister expression, and with none or only a slight movement of the head, is indicative of a mischievous temper.

The neck should be handsomely arched, and fine at the junction with the head, while the lower extremity must be full and muscular, and well expanded at the breast and shoulders. The latter ought to be high and run well back; the withers strong, firmly knit, and smooth; the breast neither too prominent nor retreating, too wide nor too narrow, and supported by a pair of straight fore-legs, standing well apart. The chest should be deep, and the girth large; the body full, and not drawn up too much in the flank; the back short, and the hips gathered well towards the withers; the loins wide and rising above the spine; the ribs springing at nearly right angles from the back, giving roundness to the body. The hips ought to be long to the root of the tail, and the latter may approach to near the line of the back, which is a mark of good breeding.

Both the thigh and hock should be large and muscular; and between the hock or knee and pastern, the legs should be broad, flat, and short; the hind legs properly bent, and all well placed under the body; the pasterns of moderate length, and standing slightly oblique; the hoofs hard, smooth, round before, and wide at the heel; the frog large and sound, and the sole firm and concave. A white hoof is generally tender, easy to fracture and to lame, and difficult to hold a shoe.

The *draught-horse* ought to differ from the foregoing, in possessing a heavier and shorter neck; a wider and stouter breast, and low withers, so as to throw the utmost weight into the collar; a heavier body and quarters; larger legs and feet, and more upright shoulders and pasterns.—*Ohio Farmer.*

ROOT-GRAFTING.

To the Editors of the Alabama Planter:

I am glad to see that you bestow so much attention upon fruit culture in your State, and that more and more interest is being manifested by our people on the subject. It is certainly a favorable omen that, instead of invariably sending as heretofore to the North for trees—the quality of which cannot be pronounced upon until they come into bearing—culturists are endeavoring to propagate from varieties of known worth in their own section. Budding and grafting are much practised by those possessing the requisite knowledge and skill, and in this way we shall, within a few more years, have the choicest varieties of all the best fruits growing in abundance in every part of the State. As to grafting, there is one mode I should be pleased to be better informed about, viz.: root-grafting. I have heard of it, but as yet have not met with any one who has either seen the operation performed or

the tree after being thus grafted. You would therefore greatly oblige me by furnishing me with such information as you may possess on the subject.

March 23, 1853. Yours, B.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

THE CAM.

RULES AND PRINCIPLES.

Fig. A.

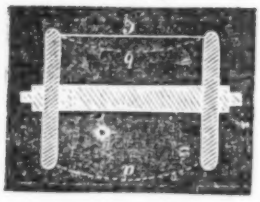


Fig. B.

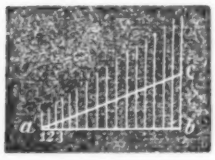
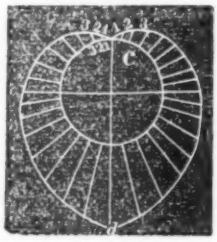


Fig. C.



To describe a *cam* or heart for a regular motion, to make a spool straight, as *c* on fig. A, draw the line *a b*, fig. B, of equal length of the spool A, between the heads; draw *b c* at right angles to *a b*, and make *b c* equal half the diameter of the head of the spool, or the height you wish the cam to rise; draw *a c*; divide *a b* into any number of equal parts, say 16. Draw the circle *c* in fig. C, the size you wish the hub, and divide it into 32 parts;

Fig. D.

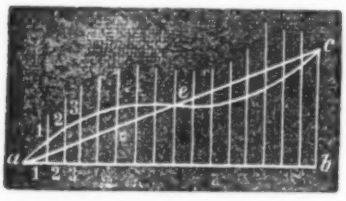
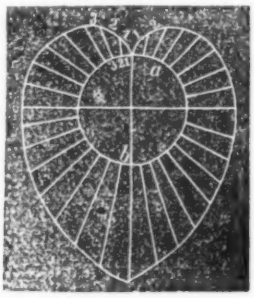


Fig. E.



and draw lines through the centre, set up from *c* the height you wish your heart to rise, as *d* equal *b c*, on B. Then take the distances on B from *a b* to *a c*, and transfer to C, as 1, 2, 3, to 1, 2, 3, &c.; and trace through those points.

To describe a heart to fill a spool largest in the middle, as *a*, in fig. A, draw D, as directed above, making *b c* equal to the height you would have

Fig. F.

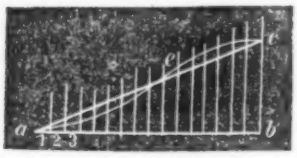
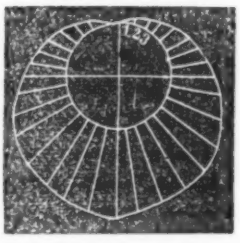


Fig. G.



your cam rise; then with the curve *a*, fig. A, in your dividing, describe the segments *a e*—*e c*, on D; draw the circle *a b*, fig. E, of the size you wish your

hub; divide it as in C; draw lines from centre through each division, and transfer from 1 to 1—2 to 2—3 to 3, &c., as in the first case, and trace through those points—taking the distances from the base line *a b*, on D, to the arcs

FIG. H.

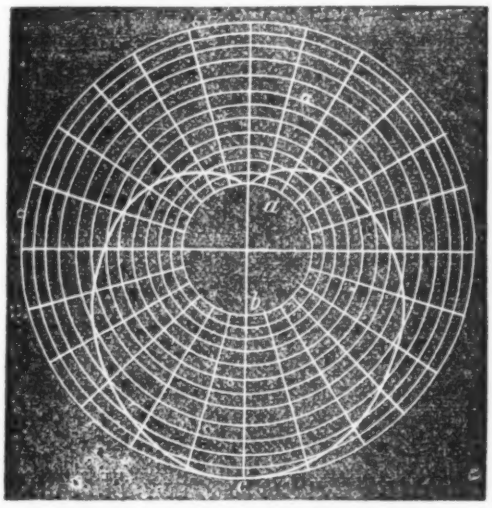
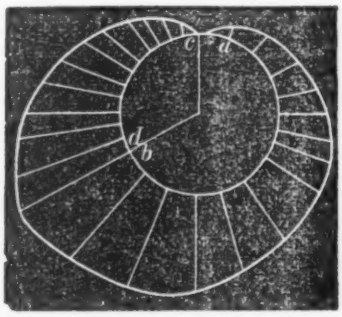


FIG. I.



a, b—e, c. The easiest way to divide the circle is to draw a circle outside of where the cam will come. Divide that into 32 parts instead of the small one.

To describe a heart that will make the spool the smallest in the middle, as *b*, fig. A, (see fig. G,) draw F as in fig. D, only describe the segments the reverse from D, and proceed as in that example.

H, is a very plain and simple way to describe a cam. Draw the circle for the hub as *a b*, and set off the height *b c*; divide the line *b c* into any num-

FIG. K.

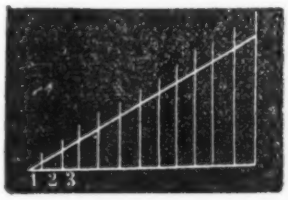
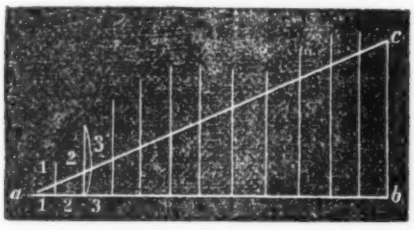


FIG. L.



ber of even parts, say 12, and describe circles through those points. Divide the largest circle *c* into 24 equal parts, and draw lines to the centre; then trace through the intersections of those lines and circles, and this will give the result. See H.

To draw an eccentric cam or heart, draw I and divide as above; draw a circle, *a, b, c, d*, fig. K, and divide it in two parts, according to the motion it is required to give, (in this case it is two to one,) and divide each into the same number of parts as fig. I, which is in this case twelve, draw lines as above from the centre through each point, and extend them at pleasure; then transfer 1, 2, 3, &c., from *a* to *b*, and from *c* to *d*, on fig. K, and trace through those points. This rule may be varied for any purpose required.

To describe a cam for a loom treadle, draw L, as directed above, *a b*, at any length: *b e* being the rise, divide *a b* into 12 parts.

Draw the circle *a* (fig. M) equal the size of the hub, and set off the rise, *b c*, fig. L, at *a b*, and describe a circle set off from *c* to *d*, the length of the

FIG. M.

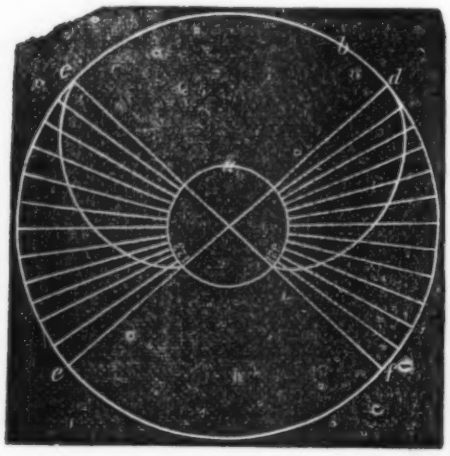
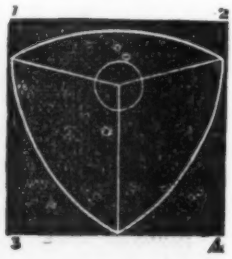


FIG. N.



bearing on the treadle. Draw the lines *c f* and *d e* through the centre. Divide *c e* and *d f* each into 12 parts, and draw the lines through those points. Lastly, transfer the distances 1, 2, 3, &c., on L, to 1, 2, 3, &c., on fig. M. This will keep the cords of the harness tight; but should it be required to have them a little slack while rising and falling, the cam may be a little straiter from *c* to *e*, and from *d* to *f*.

Fig. N is a cam to operate the valve of an oscillating engine: 1, 2, 3, 4, is a square frame in which the cam works. It is plain enough by inspection. The square frame is attached to the valve rod, which gives a motion two ways in each revolution.

ESTABAN.

JUNE BUTTER.

How delicious are our associations connected with those two words, June butter—the sweetest, best of the dairy operations of the year! The sweet new grass—the freshness of a new feast after the dry feed of winter—the renewal of a license to roam and clip, at fancy, over the fresh pastures, which gives the cow so much delight, and which OF ITSELF makes better milk—all tend to impart to June butter peculiar qualities. This is not poetry: we are quite cool and logical. Quietness of mind and freedom of body are as essential to the perfect action of the secretive organs of the brute animals as of men, and it is on this principle that mild treatment is profitable to the dairy, as well as regular and moderate exercise. Furnish good food and enough of it, and there would not be half so many "poor cows." "Native breeds" would have also a much better reputation.

But many dairymen spoil good milk. The cow does her part far better than the man does his. This is alike true in the making of butter and of cheese. But in our circle of observation, as before remarked in a short article on this subject, one great secret is to keep every thing *sweet*: and we here append a description of the process given by one of the United Society of Shakers at Canterbury, N. H.: most excellent authority, and first published, we think, in the *Farmers' Visitor*:

"The pans or other vessels in which the milk is to be set, are to be made perfectly sweet by scalding, previous to putting the milk into them. A room in the basement story, where the air will circulate freely, is preferable to a

cellar (when the weather will admit of it) for setting milk. Forty-eight hours is a sufficient length of time to raise cream for making butter to keep through the winter season.

"After the cream is taken off, the milk may stand the same length of time, but the cream that rises after the first forty-eight hours will not make butter so palatable as the first which rises, and should be churned separate.

"As soon as the cream is taken from the milk, it should be put into a tin pail, and set into a kettle of scalding water, taking care to stir the cream often, otherwise it will turn oily at the top; it should remain in the kettle until the cream is scalding hot, being particular to place it in a tub of cold water immediately. Stir it often, till it is nearly or quite cold; if it remains long after hot, it will be injured much. It will be necessary to change the water once or twice before the cream can be perfectly cold. It may then be kept for three or four days before churning, without injury.

"After churning, the buttermilk should be partially worked out; then add one ounce and a half of salt to one pound of butter. It may then be covered tight and stand till the following day; then work it over again, taking great care to work out every particle of buttermilk, which will prevent the butter from growing rancid by age. It may then be formed into cakes, or packed solid in a cask, which should be perfectly sweet and well dried.

"The inside should be sprinkled, and a little fine salt rubbed thereon. After the cask is filled, dip a cloth in melted butter, and spread it snugly over the top; cover it with fine salt, and fasten up the cask sufficiently tight to keep out the air; it should then be set in a cool place, to remain through the winter.

"N. B.—A cask made of red oak staves is preferable to any other for preserving the original sweetness of butter.

"It will add to the flavor of butter to work in a little sugar at the last working over; say a tablespoonful to four or five pounds of butter."

MACARONI FLOUR.

The Italians prepare their flour for macaroni, soup-pastes, cakes, &c., with great care and wonderful success. From a coarser grain, poorer and more dirty than we grow in England, they produce a finer flour than the best which our patent machines and most highly cultivated fields give to us. This is partly owing to their climate, which allows of methods of preparation impracticable in England, and partly to a degree of delicate manipulation and minute attention which our high-pressure rapidity sets out of the question.

All through Italy you may see, by the outhouses of farmsteads, on the open threshing-floors, in the public streets of the cities, by the sides of bridges—as in Genoa, which is one large net-work of bridges in the upper town—in the open fields and along the highways, any where and every where, small paved squares, surrounded by a wall of about two inches high, inclining on one side, and bordered by a groove or gutter on the side of the incline. In these places you see a quantity of wet corn, thrown from a bucket full of grain and water standing by the workman's side. Here the corn, after having been well washed in the bucket in many waters, is suffered to lie for a short time, until the water has drained off into the groove or gutter prepared for it. It is stirred gently; and as it dries, the wind carries off all the light particles which the water has not removed. The fine air and powerful sun do all the work of our close stoves and stifling kilns, with the superiority which fresh air

must always have over the atmosphere of a roofed apartment. When thoroughly dry, the corn is then carried away by women, who sit, one on each side of a table, and separate, *grain by grain*, with their hands, the bad from the good, the light from the full-fed, until at last only the best of this washed and cleaned and separated corn remains for the mill. Yet what does remain produces a flour superior to any thing we see in England on the very richest tables, and superior also to any thing we see in France, noted for her white wheaten flour. It is the finest flour in the world, from a poor and ill-fed, grain, and is only another proof of what great successes care, and industry and attention may obtain, even with second-class materials.

RULES AND FORMULÆ FOR CONSTRUCTING MACHINES AND PARTS OF MACHINES.

We recently copied sundry formulæ from a number of the *Polytechnic Journal*, and here present our readers with additional extracts from the same writer. The articles are written with great ability, and may be regarded as good authority. The May number of that journal contains the following additional rules:

5. *Journals of Axes.*—If we call P the pressure in pounds which acts upon a journal, d l the diameter and length of the journal in inches, the formulæ stand thus:

(*a*) For cast iron journals—

$$d = 0.0477 \sqrt{p}$$
$$l = 0.34281 + 21d$$

(*b*) For wrought iron journals—

$$d = 0.0318 \sqrt{P}$$
$$l = 0.3428 + 1.21d$$

C. Axes which have nothing to support, but are only used for the transmission of motion:

P, the power in pounds which makes the axes revolve.
R, the length of the lever in inches, upon which the power P acts.
d, the diameter of the axis.
l, the length of the axis.
n, the effect which the axis transmits, expressed in horse-power.
n, the number of revolutions of the axis per minute.
O, the angle of torsion of the axis, expressed in degrees.

(*a*) For axes of machines worked by hand—

$$d = 0.158 \sqrt[3]{P\,R}$$

One twenty-fifth of the strength of wrought iron axes, and one sixteenth of cast iron axes, is brought into requisition by the above formulæ.

The angle of torsion is—

$$O = \tfrac{1}{3\,6} \frac{(l)}{(d)} \text{ for wrought iron.}$$

$$O = \tfrac{1}{2\,6} \frac{(l)}{(d)} \text{ for cast iron axes.}$$

(*b*) For axes which are not worked by hand—

$$d = 0.159 \sqrt[3]{P\,R}; \text{ or} = 6.299 \sqrt[3]{\frac{N}{n}}$$

By this formula, one fiftieth of the strength of wrought iron, and one thirty-third of cast iron is brought into operation.

DAIRY HUSBANDRY IN NEW-YORK.

About forty years ago, the dairy business was commenced as a distinct branch of husbandry in the State of New-York, under favorable auspices. It had a slow growth for twenty years, during which several millions of acres of native forests were cleared and brought under the plough, and paid a larger immediate profit in grain culture than could be realized from milk, butter, and cheese. As the virgin soil parted with its elements of crops by tillage, and failed to produce remunerating harvests, farmers extended their pastures and meadows, and diminished their grain fields, until New-York has become the largest stock-growing and dairy State in the Union. It has about sixty per cent. more capital invested in live stock than either Ohio or Pennsylvania, according to the census of 1850. The returns are respectively as follows: — New-York, $73,570,499; Ohio, $44,121,741; Pennsylvania, $41,500,053. The six New-England States contained live stock worth $49,867,721. These figures reveal the interesting fact that New-York contains more live stock by $23,702,777 than all New-England. The latter contained in June, 1850, 618,237 milch cows; New-York, 931,324; being fifty per cent. more than the six New-England States.

New-York reported at the last census, 49,741,413 pounds of cheese, and 79,766,094 pounds of butter. The six New-England States reported 27,128,778 pounds of cheese, and 43,637,477 pounds of butter. If we divide the number of pounds of butter made in New-England by the number of cows, the average is a fraction over seventy pounds a head. In New-York the average is eighty-five pounds ten ounces to each cow. Of cheese, the average in New-York is fifty pounds five ounces; in New-England it is forty-three pounds thirteen ounces. These figures show that the cows of New-York produce some twenty per cent. more butter, and twelve per cent. more cheese than the cows of New-England. Do the former yield any more milk each on an average than the latter?

We think that they do; not alone from the facts above stated in reference to butter and cheese, but because the population of New-York in 1850 exceeded that of New-England by 363,174. New-York contained 3,090,022; New-England, 2,726,848 inhabitants. There is no good reason for believing that the people of New-York consume less milk per capita than the people of New-England, before it is used for making butter or cheese; and if they do not, then a larger population by 363,174 should leave a less quantity of milk for dairy purposes. Hence we infer that the dairy cows of New-York are superior, as a whole, to those of New-England; and we will now add that they are not only better than those of any other State in this country, but better than any which exist in Ireland, England, or Scotland, or on the continent of Europe, taken as a whole.

To do full justice to the dairy husbandry of New-York in comparison with that of Great Britain, Ireland, and other nations, as well as with the several States of this republic, would require the space of a volume, and much more labor than we can bestow upon the subject. There are some State statistics, however, bearing on the improvement of the dairy stock in New-York, to which we invite particular attention, as deserving of far more consideration than they have hitherto received. In drawing up the bill and schedules for the collection of the agricultural statistics of New-York in 1845, (as chairman of the Committee on Agriculture,) the writer was careful to have all the cows milked in the State counted. This was done, and resulted in a total of

999,490; and now showing a falling off in 1850 of 68 066. Large as this decrease appears, it is really larger than the figures indicate.

There was a difficulty in stating, in the census of 1850, the number of cows actually milked in each State, because in some States most of the cows giving milk rear their calves by their sides, and are never milked by hand at all. Hence the schedule calls for "milch cows," in which dry cows are returned as belonging to this division of neat stock, rather than to "other cattle," or "working oxen." In New-York, one cow in twenty (perhaps one in fifteen) gives no milk. Deducting the former number, or five per cent., from the 931,324 returned in 1850 for dry cows, and the number milked would be 874,758. These figures show that the number milked in 1850 was 124,732 less than in 1845. Possibly this estimate of the reduction may a little exceed the truth; but the aggregate falling off in five years of the neat stock in the State was 194,691, or nearly 200,000 head. Of this diminution, it is safe to say that one half were cows; indicating a falling off of about ten per cent. in five years.

We come now to the interesting and exceedingly instructive fact, that nine hundred thousand cows (in round numbers) yielded more milk, butter, and cheese, (being better milkers and better kept,) in 1850, than a million did in 1845. The cheese returned in 1845 was 36,747,976 pounds. These figures are less than the returns of 1850 by 12,991,437 pounds. The pounds of butter in 1845 were 79,501,733, showing an increase in five years of 264,361 pounds. These figures are the more noteworthy from the fact that while nine cows actually yielded more cheese and butter than ten did, the population to consume milk every day in the year, before it was made into cheese or butter, was 494,323 larger in the State in 1850 than in 1845. Of course it is impossible to say how much milk this increase of population would consume; but in 1845 there was a fraction over five persons to two cows in the State. At this ratio of increase, the number of cows in 1850 should be nearly 1,200,000, instead of 931,324. No one, we trust, will understand us as intimating that all the cows in New-York are good milkers, or are properly kept. We desire simply to do justice to the intelligent dairymen and farmers who, during the last forty years, have rendered their country an invaluable service. These are the men who sustain our State and County Agricultural Societies, and the agricultural press, and with whom it is an honor to coöperate for the advancement of the arts and sciences which belong to the several branches of rural affairs.

Dairy husbandry has a deeper philosophy than many suppose; nor can it be comprehended without considerable close thinking and study. Let the pastures and meadows of a dairyman represent a thousand tons of grass per annum, exclusive of the water which the forage may contain. This forage is to be fed to cows for the most economical production of milk, butter and cheese. Would it not be cheaper in the long run for him to pay $50 a head for first-rate milkers, than to take poor ones as a free gift? We believe that poor cows do not pay the cost of their keep, or the value of their food twelve months in that length of time; therefore the more of such animals there are in a county or State, the poorer it is in agricultural wealth and income. In the State of New-York, a mean animal is a tax upon its owner and the community, and should be so regarded by all. As the natural resources of the soil become exhausted, farmers can less afford to keep inferior animals of any kind; for the first cost of grain, hay, grass, roots, and straw, increases with the increase of manure needed to produce good crops. In 1845, New-York contained 6,443,865 sheep; in 1850 the number was reduced to

3,453,241; decrease in five years, 2,990,624. The number of sheep slaughtered in the five years named was much larger than the difference between the larger and smaller sums, otherwise the natural increase would have prevented so great a reduction. It was necessity that cut their throats. To replace three millions of sheep by dairy stock, at least four hundred thousand cows would be required. We shall take another occasion to demonstrate beyond all dispute, that not less than eight and a half of the twelve and a half million acres of land under improvement in New-York is suffering deterioration at the rate of three dollars a year by parting with its elements of fertility. What we desire at this time, is to call attention to the science of transforming the proper food of cows into milk, so that any given quantity of forage shall yield the maximum of dairy products.

The elements of this science are both anatomical and physiological; they relate to the digestive, respiratory, assimilative, and milk-secreting organs of the cow. Improper feeding will result in a far greater loss of milk from any given amount of food consumed even by a good cow, than would be likely to occur from a poor cow, if properly fed. In the first place, each and every lactiferous animal is compelled to support the natural warmth of her body by respiration, which never ceases, and literally burns up nearly, if not quite two thirds of the aliment which passes through the walls of the intestines into the blood-vessels; and from whose blood milk is separated. Not only does breathing take priority of milk making in the economy of nature, but the daily and indispensable repair of every muscle, bone, membrane, nerve, and other organ, also claims priority to the full secretion of milk. In a word, the blood of a cow takes care of her system first, before it yields more than a trifle to feed her offspring, for whose benefit milk is elaborated.

Milk being the natural surplus of food in the blood-vessels, over and above what the ever-pressing calls of respiration and nutrition demand, we trust that it is not difficult for the reader to comprehend the fact that a given amount of aliment thrown into the stomachs of four cows, may yield twice the surplus, after supplying all the wants of their systems, to be transformed into milk, which could be obtained if the aliment had five systems to warm and support instead of four. In the case assumed, there is nutriment enough to keep four cows in sound and vigorous health, and allow each to have a surplus in her blood equal to the formation of four or five gallons of milk in twenty-four hours. Divide this mass of food or aliment into five parts instead of four, and the breathing and other vital functions of the fifth cow (we care not how excellent a milker she may be) will consume and substantially waste full one half of what might have been milk in the lacteal glands of four cows.

It is not enough to have first-rate cows; the dairyman should know so much of their anatomy and physiology as to be able to use the living machines in his possession to the best advantage. A good machine of any kind in the hands of an ignorant, unskilful operator, uniformly turns out bad work. That is, the net profit is much less than it ought to be. Without entering into any explanation of the science of dairy physiology, the reader may make this induction from our remarks: The dairyman should keep no poor cows, and as few good ones as will consume the food to be converted into milk. If he intends to feed high, let the transition from low to high feeding be gradual; all sudden changes are injurious, whether upward or downward in their course. Provide, by the aid of corn grown for forage, by manuring pastures and meadows, and by root culture, a plenty of food for whatever cows are kept for dairy purposes. Have yards and stables so

arranged and littered with straw, muck, forest leaves, or some other absorbent, as to preserve from waste or loss all the droppings of domestic animals.

After the writer came to Washington in 1849, to take charge of the agricultural department of the Patent Office, he went immediately to the office of the Census Board, to get the agricultural schedule changed so far as to enumerate all the cows in the United States. This was done, and the number returned by the marshals was 6,391,946. For what useful purpose was this separation of milch kine from other neat stock? This is a question which every farmer ought to study. A general and most valuable improvement of the bovine race was contemplated by the mover in this matter, who had long felt the necessity of reliable agricultural statistics. The six and a half million cows in the United States now yield less than a moiety of the milk which the food consumed is capable of producing. Now, if we had an experimental dairy farm, with the needful appliances, we would soon demonstrate the truth of this statement in the most satisfactory manner. But public opinion is not yet ripe for the application of science to American husbandry; and therefore no truly scientific experiments, like those of Boussingault and Thompson, are likely to be made in this country during the life of the present generation. According to the experiments of M. Perrault and Pabst, a cow giving a full flow of milk needs six and a quarter pounds of good hay or its equivalent in grass or roots for every 220 pounds live weight.

It is not too much to say that one hundred million dollars a year may be added to the income of the country by the judicious improvement of dairy stock, which implies equal improvement in their management and keep.

The *Genesee Farmer*, from which the above is taken, deserves a medal for so valuable a paper.—Eds.

THE HORSE: DESCRIPTION OF THE VARIOUS PARTS, AND SOME OF THEIR DISEASES, &c.

We present our readers with the following report of another of Dr. Slade's veterinary lectures, delivered at the State House, Boston, as published in the *Traveller:*

Dr. Slade commenced by giving a description of the spine of the back, consisting of 23 bones, 18 of which are called dorsal vertebræ, composing the back, and five occupy the loins. The bones of the spine are connected by a cartilaginous substance possessing great strength and perfect elasticity, yielding to every jar and motion, and yet allowing no movement between the bones incompatible with the most perfect security. Powerful ligaments also run along the under surface, and render the spine very strong. No moderate degree of violence can injure the parts, but sometimes by brutal usage these ligaments are strained, inflammation follows, and portions of the ligaments are changed to bone, thus destroying much of the elasticity of the parts. When this difficulty exists, the horse is said to be "broken-backed," or "chinked in the chine."

The length of the back is important. A long-backed horse is better adapted to speed, and is more easy in his paces, but at the same time he is weaker in the back, and more liable to be strained. For general purposes, the horse with a short body is usually preferred, as he is more hardy, and possesses sufficient speed for all practical purposes. Most of our best Northern

stock are of this nature, and are proverbially fitted for general purposes, combining health, strength, and a fair share of speed. The back should be slightly depressed immediately behind the withers, and continue in almost a straight line t · the loins. Some horses have quite a hollow behind the withers, and seem peculiarly adapted to the saddle. Occasionally a horse is found whose back curves outward. Such horses are called "roach-backed." This defect destroys in a great measure the usefulness of the animal.

The elevated ridge which the spinal processes of the dorsal vertebræ form is called the withers. High withers indicate good action and speed, because they afford larger surface for the attachment of the muscles of the back and shoulders, and give them fuller play. For general purposes, high withers are invaluable, although some most celebrated race-horses have had low withers. This is found to be compensated by finely proportioned muscular hind quarters. The heavy cart-horse also can better throw all his strength into the collar if he has low withers.

The loins of the horse, for strength, cannot be too broad. They should be long, and slightly rounded.

The flank is the space between the ribs and the haunches, and when too large, indicates weakness in the loins. When the flank rises and falls in respiration quicker than ordinarily, it betokens either fever or defective lungs. If the inspiration is performed readily, and the expiration with difficulty, the flank seemingly falling with double quickness, the horse is broken-winded. The movement of the flanks should be observed before buying a horse, as it indicates the condition of the respiratory organs.

If the saddle is allowed to press long upon the withers, a tumor is formed. It may sometimes be dispelled by cooling applications; but if the swelling continues, poultices should be applied to hasten the formation of matter, and then it should be freely evacuated by passing a seton through it, or by lancing. Other tumors are also formed by the manner of putting on the saddle, and are best treated with cold or salt water.

The external parts of the abdomen, or belly, are the common integuments, the abdominal muscles, the parts of generation in the horse, and the teats in the mare. The internal parts are the coverings of the viscera and the viscera themselves.

Investing the abdominal cavity, and giving support as well as a covering to its contents, is a strong membrane called the peritoneum, of the same structure and for the same object as the pleura. Its outer surface is loose and roughened, but its internal surface extremely smooth and glistening, secreting a fluid that prevents all friction between the intestines. This membrane is remarkable for the prolongation which it gives to certain organs, and especially to certain parts of the intestines. It is also very muscular and elastic.

The stomach of the horse is remarkably small, as he is often obliged to labor after a full meal, and it would be dangerous to have as large a stomach as other animals. To accommodate the food which is eaten, what is swallowed passes rapidly through the stomach into the intestines, where it can give him no inconvenience. The stomach is made up of four coats: the investing membrane or peritoneum, the muscular coat, the cuticular coat, and the villose or velvet coat.

The stomach of the horse is very liable to disease, and is sometimes affected by idiopathic inflammation or gastritis. The stomach is also sometimes ruptured, and sometimes the horse will live after the accident two or three days.

To show the insensibility of the stomach, the lecturer narrated the case o.

a horse to whom, by mistake, three or four ounces of liquid blister was administered. The horse lived twelve days, and worked until two hours before he died, eating as usual all the time. He then fell and struggled in fearful agony until he expired. The stomach was found ruptured in many places, and almost decomposed, and the food was lodged between the intestines.

The intestines are divided by their dimensions into large and small intestines. In a full-grown horse the intestines are ninety feet in length, the small being sixty-six feet long and the large twenty-four. The food, after being received into the stomach, passes into the first small intestine in the shape of chyme. Here it undergoes a change, and is converted into chyle. The bile from the liver here mixes with the food, and is the principal agent in producing the chyle.

After passing the small intestines, we find the large differing from the small in structure, appearance, and size.

The first, known as the blind gut, terminates in a valve which prevents the return of substances. A horse often drinks more than his stomach can contain, and the water finds a reservoir for its reception in the second large intestine, called the colon, and capable of holding twelve gallons of water. It is so constructed that the food is delayed in its passage, and thus all the nutritious parts are absorbed. The third large intestine, the rectum, is the receptacle for the excrement until it is thrown off by the voluntary action of the animal, aided by the diaphragm and the muscles of the belly. Washy horses are those whose abdominal cavities are of little capacity, and therefore have frequent and liquid evacuations.

Early in the spring and summer, horses are troubled with worms called bots. The history of these bots is curious. In the fall, flies may be seen to flutter around the horse, and they deposit in his hair small eggs. The horse, in licking himself, heats these eggs and hatches worms, which he takes upon his tongue, and finally swallows. They subsist in his stomach on the fleshy and insensible part, and finally pass out through the intestines, and out of the body, attaching themselves to the animal near the tail. Nothing can be done but to give them their course, and pick them off the tail.

The diseases of the intestines are a very singular and interesting class. Spasmodic colic is caused by the muscular fibres of the intestines becoming spasmodically contracted. The horse is always taken suddenly, and the disease may arise from the drinking of cold water, or by exposure to cold air. There is a speedy cure. Turpentine administered in opium will relieve him. The horse may be trotted about, but not galloped.

Flatuous colic is the giving out of gas produced by green food. The symptoms are at first like those of the spasmodic colic, but the walls of the abdomen become distended. The remedy is the administration of chloride of lime. If this cannot be obtained, as a final resort, the intestines may be punctured.

Real inflammation of the bowels is extremely fatal. The disease does not come on suddenly, but some fever is at first observed. The ears and extremities are cold. Giving cold water when the horse is heated, or washing his belly and then letting him stand, often cause this disease. If the symptoms continue, the horse becomes crazy, and throws himself about in a fearful manner. Suddenly there is a pause, and the intestines become mortified, convulsions come on, and the horse dies.

The difference between colic and inflammation may be summed up as follows: In colic the attack is sudden, the pulse is increased, and the strength is not altered. Friction of the belly and moving give relief, while there is

the same warmth in the extremities as usual. Inflammation comes on gradually. The strength is diminished and the horse flags. The extremities are cold, and motion gives no relief.

[We append also the following, on the same subject as that of the preceding article, it being one of great importance to all classes. The horse is peculiarly exposed to injury, both from violence and from disease. According to the statements of Dr. Chas. M. Wood, V. S., a new form of disease has attacked the horses of Massachusetts, which, in many instances, has proved fatal. The Doctor's applications, however, have proved effectual. We copy from the *Boston Cultivator:*]

A disease of a peculiar character, sometimes fatal in its effects, has lately made its appearance in the feet of horses in this city and vicinity, and I am informed that it prevails in many parts of the country, having already caused the death of many fine animals. It has often presented itself under a formidable aspect, and at other times the symptoms are so various, that many horse-owners entertain the most vague and contradictory notions respecting it. I have seen the commencement of this disease, have treated twenty-seven cases, and have not "yet lost the first." All of them have recovered, and have resumed their work, excepting six, which are doing well. I will here remark, that nearly all the horses affected by this disease are those of an ordinary or low breed, such as team and cart-horses. Some of them, however, were highly valuable animals.

The first symptoms usually observed are slight swellings, accompanied with intense pain and soreness upon the pasterns, or below the fetlock joints. The inflammation is acute, and goes on rapidly to suppuration. In some subjects, the disease seems to be local in its character, while in others it is accompanied with loss of appetite, great thirst, restlessness, and extreme constitutional disturbance. These symptoms are quickly succeeded by a sloughing of the integument or skin about these parts, commencing at the coronet and extending upwards towards the fetlock, presenting an ulcer of the most formidable character, discharging an ichorous and very offensive matter. I have rarely seen the disease extend more than two or three inches above the coronet, or hoof, and it often affects but one side of the foot. Various causes are assigned for this disease, and various remedies are resorted to by the "horse-doctors," such as poulticing with dressings of charcoal and sulphate of copper, but they are all ineffectual.

As to the real causes of this distemper, we have but little to say, for we can offer nothing very satisfactory on this point. Whether it be owing to any peculiar poison in the atmosphere, or to any sudden and imperceptible or chemical changes to which it is liable, we will not venture to state, for in our inquiries into the origin of a disease, we are apt to imagine that to be a *cause* which is only an *effect;* and in our searches into the source of any complaint, we find it often to elude our grasp, when we fancy we have obtained it. I would, however, offer a few suggestions as to the probable cause of this malady. Many horses have the lower portion of their extremities constantly in a humid condition; hence the vascularity of the parts becomes weakened from the circulation being enfeebled. In time there is a change, reäction takes place, the circulation is quickened, and the parts swell; the coronet is enlarged, abscesses are formed and break, and a sloughing of the integument speedily follows. In some cases, matter gravitates between the hoof and the substance beneath it; this, if not soon arrested, disunites the sensitive from the horny lamina; the hoof may then fall off, and the animal falls a victim

to the disease, or the want of judicious treatment. Sometimes one foot only, either fore or hind, is affected; at other times, both fore or both hind feet, and in some cases, one fore and one hind foot; but I have never seen more than two feet affected on the same horse, and generally on the inside—*i. e.*, from the inside quarter to the back part of the foot.

I would observe, this disease is unlike the foot-rot in sheep and cattle, inasmuch as it begins at the top of the foot, and not at the bottom. I have said that the integuments slough away, and then the tendons and ligaments are exposed; and at this stage of the disease, the pain and suffering of the animal are intense.

As to treatment, I have not much to add; suffice to say, that poultices do more harm than good, from the fact that they cause the disease to spread, by promoting suppuration. I find that the drier the parts are kept, the more apt is nature to restore them to their healthy condition; but be the treatment what it may, it requires all the skill of the veterinary surgeon to prevent disorganization of the parts above and within the hoof. Such are the results of several examinations that I have made of horses that have died of exhaustion under this dreadful malady.

THE OTTO OF ROSES.

A CORRESPONDENT of the *New-York Times*, writing from Constantinople, gives the following interesting account of the manufacture of the otto of roses.

The "spicy East," "the perfumed gales of Araby," "redolent of odors as an Oriental bride," these common phrases indicate our usual associations with the East. It is true that the Orientals love perfumes, and perhaps have a religious regard for them, because Mohammed loved them excessively, and praised the use of them. But instead of depending on Eastern resources, the Constantinopolitans are equally the purchasers with ourselves of the essences and pomades of Paris. When the emporiums of commerce for the Western barbarians of Europe were in the East, they of course received their perfumes from thence; but the sources from whence sweet-scented odors are now derived is the wide, wide world, and no longer the indefinite East. Even the queen of aromas, otto of roses, so far as used in Europe and America, is nearly all of it raised in Europe. The word "otto" is more properly "attar," which simply means perfume, and the substance itself in Turkey is usually called oil of roses.

The time has been when Tunis used to furnish the finest otto of roses known in Europe; at present not an ounce is exported from there. Mecca, Aleppo and Damascus have been said to yield it in abundance; but now, all these places, including Tunis, are supplied from the market of Constantinople. Ghazipore in India, on the Ganges, (and not in

> "The Vale of Cashmere
> With its roses the brightest the world ever gave,")

still prepares a rich and extremely dear oil, but it is never exported thence to England. It is almost entirely consumed among the people there on festive occasions. Its price also is enormous, said to be one hundred dollars an ounce.

The centre of production in Turkey in Europe for the oil of roses which is exported, is in a small district called Hasanlik, in Bulgaria. Hasanlik is a shire-town about 200 miles north-west of Constantinople, and gives its name to a district of thirty-six villages, which is devoted mainly to the cultivation

of the rose. Though the villages are all situated on a plain on elevated ground, yet, as the plain is protected by high mountains, the climate of the region is very moderate. The inhabitants are all of the Bulgarian Sclavonic race, in part Mussulmans and in part Christians. The rose which they cultivate for the sake of the leaves is the Red Centifolia,

"The floweret of a hundred leaves,"

and is planted in the open fields with the same profusion as corn or potatoes with us. The roses are in full bloom by the month of May, and before the second week in June, the harvest of the leaves has been completed, and nothing is done in collecting them at any other time. During the season of flowering, the whole country, for miles beyond the district, is redolent with odor of roses. The digging and pruning of the bushes, collecting the leaves, the process of distillation, and the manufacture of vessels to hold the oil, occupy the people nearly the whole of their time.

In distilling the oil, the usual process for extracting volatile or essential oils is pursued. The rose leaves while fresh are placed in the alembic, and fresh water is poured upon them. The water which comes over is successively distilled, and finally the oil, being the lightest, rises to the top and is skimmed off. The oil is limpid, but with a tinge of orange color. It is said to take three hundred thousand roses to yield an ounce of oil. It is brought to Constantinople in flat-sided, round-edged, tinned copper vessels, each hermetically closed and sealed with the maker's name. These cases vary in size from those capable of holding an ounce to those which hold seven pounds and even more. At Constantinople, after passing into other hands, it is put up in gilt bottles which preserve the antique form of two hundred years back, and are manufactured in Bohemia expressly for the purpose. . .

Various less expensive oils are mixed with the otto of roses. Among those used for this purpose are sandal-wood oil, and a new oil made from a kind of geranium. In the oil of roses usually for sale at the shops, there is an admixture of fifty per cent. of foreign oils. We are told that America is a larger consumer of otto than any other country of the same amount of population.

The water that has been employed in the process of distillation to obtain the oil of roses, furnishes what is called rose-water. It is brought abundantly to the city in barrels like wine, and sold about as cheap, costing not more than eight or ten cents a quart. Constant use is made of it on festival occasions in the Greek and Armenian churches, and it is also sprinkled on guests, as a token of welcome, by the members of a family.

HOW TO MANAGE A WORN-OUT FARM.

The following statement is worth a careful study. It is endorsed by the editor of *The Farm and Journal* as reliable. Do not fail to read it.

MR. EDITOR:—About seven years since, I took possession of the farm on which I at present reside. At that time its condition was any thing else but promising, for in addition to the fact that weeds abounded, fence-rows were in bad order, and the building scarcely tenantable, the land was to all appearance thoroughly impoverished. Being a young man, but newly married, most of my friends remonstrated strongly against the farm. They pointed out all the disadvantages attending the step, and every one predicted that I

would starve before the farm would produce as much as my family and cattle would consume. I must confess the picture drawn by my dear friends was not the most encouraging, so that I began to have some misgiving myself, and concluded, before I made a final determination, to hold a consultation with my wife, in whose good sense and judgment I placed as much confidence as my own. Accordingly, one evening I broached the subject to her, fairly and honestly setting forth the advantages and disadvantages which would be likely to follow. Mrs. L. was a farmer's daughter, and a good farmer's daughter at that. She was one of those young ladies whose sense of duty always led her to estimate the *useful* more highly than the ornamental. She was industrious and frugal, and withal of a thoughtful and observant turn of mind. The loss of her mother at an early age threw the whole management of her father's large household upon her. She improved the opportunity thus offered, or rather pressed upon her, not only by rendering herself familiar with the domestic affairs of her father's house, but also, from the fact of frequent conversations with him in relation to his farming operations, acquired a pretty good knowledge of the manner in which he conducted them. She was therefore no bad counsellor, but one whose opinion I preferred infinitely to many of those friendly relatives who are always more liberal with their advice than their money.

After stating the case fairly to her, she quietly remarked, "Well, that the farm you speak of renting is out of order may not be denied. The house is not a very comfortable one, but with a little of your assistance I will engage to render it habitable at least. A little economy and good management will enable me to supply our table with vegetables, and sell enough besides to provide such matters as we may need to render our situation more pleasant. If you will manage the farm, I will take care of the house; and if you will give heed to one of father's favorite sayings, '*plough deep*,' I think we shall be able to make both ends meet." "Enough said," was my only reply. The farm was rented, and as much stock and implements purchased as our little capital would allow. With hopeful hearts, my confident little wife and myself took possession of the old farm.

From a small manure-heap (left by the former tenant) we gave the garden a good dressing, and afterwards a thorough ploughing, my wife occasionally admonishing me to "*plough deep*." She then took possession of it, (my relatives' remonstrances to the contrary notwithstanding,) and very soon it gave satisfactory evidence of her skill and taste.

But now came the "tug of war." Field-ploughing was to be done for oats, corn, and potatoes; but where was the manure to come from? Our little stock of money was barely sufficient to purchase the actual necessaries of life for ourselves and stock until the garden and fields would produce their crops; so that not a dollar was left for the purchase of manure. I had not thought of this before, and for a moment regretted the step we had taken. With a heavy heart I mentioned my new troubles to my wife, who, with a cheerful tone, remarked, "'*Plough deep*' this year, George, and let us see the result." Reassured by her confident manner, I geared my horses—three fine, stout fellows—and commenced ploughing. The ground was in fine condition, and, remembering Mrs. L.'s admonition, I set my counter *deep*. Away we went, and after a furrow or two, I stopped to examine the soil I had turned up. Much to my surprise, and, I assure you, sincere pleasure, I observed that it differed materially in appearance from that turned up by the former tenant. There was a mystery about this that puzzled me for a moment; but recollecting that I had ploughed some four or five inches deeper than my prede-

cessor had done, I began to see the wisdom of my wife's advice, to plough deep. I found a manure-heap. My little knowledge of soils (for I had been an attentive reader of the only agricultural journal I then knew of, the *Albany Cultivator*) satisfied me of the fact. Every round I made, my heart grew lighter, until, when at noon I returned home, I felt as well satisfied that I should have good crops, as any of my neighbors who had applied their hundreds of loads of manure.

The oats were sown, and corn and potatoes planted. My neighbors looked on and smiled at my verdancy, in hoping to realize any thing from that soil without manure, and I verily believe I too should have doubted, but for the hopeful spirit of my wife. She was always cheerful and happy. Busy as a bee the livelong day, the house grew more comfortable and snug. The cows yielded a good supply of milk, which her ready hand turned to first-rate butter and cheese. The garden yielded most excellent vegetables, which, with the butter and cheese, were readily disposed of for cash at our country town. The chickens too acknowledged her fostering care, and in fact every thing she turned her hand to appeared to prosper.

With an anxious heart, however, I looked forward to the time when I should be able to judge of the character of my growing crops. The season was good, and I soon had the pleasure of seeing them as flourishing as any of my neighbors', and when harvested, they proved equally good. But this could not last long. I had strong faith in the virtues of deep ploughing now; but common sense taught me that the time must come when, without some kind of manure, I should be worse off than ever. My manure-heap was increasing, but not rapidly enough to furnish the supply necessary. My wheat ground required it all, and more than all; and I knew that every forkful I could make during the winter would be insufficient for my corn crop during the spring. At this juncture, my agricultural paper came in as an adviser. I had read with much care and interest an article on clover as a fertilizer, when turned under in its green state, and at once resolved to try it, as I had the deep ploughing. Clover seed was purchased, and sown among the wheat late in February; and as soon after harvest as I found it to be in what I considered its rankest stage of growth, I turned it under, keeping in mind my wife's motto, "*plough deep.*" I again put it in wheat, and the following season I harvested a fine crop. I do not now remember the average yield, but know that it was nearly thirty bushels to the acre. Thus far things began to look so encouraging that I began to think of purchasing the farm, and did so the ensuing fall, at a very low rate. As the extent of my farming enlarged, so did the number of my stock, and as a consequence, my manure-heap grew also. But this latter fact did not deter me from pursuing the plan I had originally adopted of *ploughing deep and turning under green clover.*

In concluding this hasty sketch, I would remark that it was prepared not with any desire on my part either to extol the merits of my better half, or claim originality for the method pursued; but simply to show that it is not so difficult a method to restore what is generally termed worn out lands, as many suppose. By deep ploughing and green manuring, I have brought my farm from a state of almost barrenness to what may be considered a fair degree of fertility. I apply, it is true, all the manure I can make, (and I assure you it is not a little now,) but do it in connection with the clover; and the value of the system may be estimated by the fact, that the average yield per acre of corn for the last two years has been sixty-five bushels, while my other crops are equally good. If the same success attends my

efforts which have thus far followed them, I shall in two years have my farm paid for; and as a closing item I will mention that the price paid for it was twenty-four dollars, and I have refused seventy-five dollars an acre for it within the last six months. G. L.

Franklin County, Aug. 9, 1852.

THE HISTORY AND CULTURE OF THE MIGNONETTE.

THE following, written by Mr. Dennis Murray, one of the best gardeners in or around Boston, for the *Journal of Agriculture*, will be read with interest:

It is now an age since this fragrant weed of Egypt first perfumed the European gardens, and it is so far climated, as to spring from seed of its own sowings. The *Reseda Odorata* first found its way to the south of France, where it was welcomed by the name of *Mignonette*, (Little Darling.) which was found too appropriate for this sweet little flower to be ever afterwards exchanged for any other. By a manuscript note in the library of the late Sir Joseph Banks, it appears that the seed of the mignonette was sent in 1742, by Lord Bateman, from the Royal Garden at Paris, to Mr. Richard Bateman, at Old Windsor; but we should presume that this seed was not dispersed, and perhaps not cultivated beyond Mr. Bateman's garden, as we find that Mr. Miller received the seed from Dr. Adrian Van Royen, of Leyden, and cultivated it in the Botanic Garden at Chelsea, in the year 1752. From Chelsea it soon got into the gardens of the London florists, so as to enable them to supply the metropolis with plants to furnish out the balconies,—a fact noticed by Cowper, who attained the age of twenty-one in the year that this flower first perfumed the British atmosphere by its fragrance. The author of the Task soon afterwards celebrates it as a favorite plant in London—

> "———the sashes fronted with a range
> Of orange, myrtle, or the fragrant weed."

The odor which this little flower exhales is thought by some to be too powerful for the house; but even those persons, we presume, must be delighted with the fragrance which it throws from the balconies into the streets, giving something like a breath of garden air to the "close-pent man" whose avocations will not permit a ramble beyond the squares of the fashionable part of the town. To such persons it must be a luxurious treat to catch a few ambrosial gales on a summer evening, from the heated pavement where offensive odors are but too frequently met with. We have frequently found the perfume of the mignonette so powerful, in some of the better streets, that we have considered it sufficient to protect the inhabitants from those effluvia that bring disorders with them in the air. This genus of plants, of which there are a good many species, was named *Reseda* by the ancients, from *resedare, to assuage*, because some of the species were esteemed good for mitigating pain.

We find that this sweet *Reseda* has crept into the armorial bearings of an illustrious family of Saxony, by the following romantic tale: The Count of Walsthim was the declared lover and intended spouse of Amelia de Nordbourg, a young lady possessing all the charms necessary for the heroine of a modern novel, excepting that she took delight in creating little jealousies in the breast of her destined husband. As the beautiful Amelia was an only child of a widowed mother, a female cousin, possessing but few personal charms, and still less fortune, had been brought up with her from infancy as a com-

panion, and as a stimulus to her education. The amiable and humble Charlotte was too insignificant to attract much attention in the circles in which her gay cousin shone with so much splendor, which gave her frequent opportunities of dispensing a part of that instruction she had received on the more humble class of her own sex. Returning from one of those charitable visits and entering the gay saloon of her aunt, where her entry or exit was now scarcely noticed, she found the party amused in selecting flowers, whilst the Count and the other beaux were to make verses on the choice of each of the ladies. Charlotte was desired to make her selection of a flower. The sprightly Amelia had taken a rose, others a carnation, a lily, or the flower most likely to call forth compliment; and the delicate idea of Charlotte in selecting the most humble flower, by placing a sprig of mignonette in her bosom, would probably have passed unnoticed, had not the flirtation of her gay cousin with a dashing colonel, who was more celebrated for his conquests in the drawing-room than in the field of battle, attracted the notice of the Count, so as to make his uneasiness visible; which the amiable Charlotte, ever studious of Amelia's real happiness, wished to amuse; and, to call back the mind of her cousin, demanded the verses for the rose. The Count saw this affectionate trait in Charlotte's conduct, took out his pencil and wrote for the rose,

"Elle ne vit qu'un jour, et ne plait qu'un moment,"

which he gave to the lovely daughter, at the same time presenting the humble cousin with this line on the mignonette:

"Vos qualites surpassant vos charmes,"

Amelia's pride was aroused, and she retaliated by her attention to the Colonel and neglect of the Count which she carried so far as to throw herself into the power of a profligate, who brought her to ruin. The Count transferred his affections from beauty to amiability, and, rejoicing in the exchange, and as well to commemorate the event which brought about his happiness and delivered him from a coquette, he added a branch of the sweet *Reseda* to the ancient arms of his family, with the motto,

Your qualities surpass your charms.

The mignonette is transformed into a perennial shrub, which dispenses its odors at all seasons of the year, by the following simple treatment: A young plant should be placed in a garden-pot, with a stick of about 18 inches in height inserted by its side, to tie up its branches to; as it advances in height, the leaves and young branches being kept stripped off from the lower part, so as to form a stem to the height required, this stem will become sufficiently hard and woody to endure the winter, by being placed in a green-house or the window of a sitting-room, and may be preserved for several years, if air is given to it whenever the weather will allow, so that the young branches do not become too delicate. As soon as the seed-vessels begin to form, they should be cut off, which will cause the plant to throw out a fresh supply of blossoms; but these plants should never be suffered to perfect their seed, as it would greatly weaken them, and generally cause their entire decay; for the sweet *Reseda* is an annual in its proper climate, and therefore naturally decays when it has ripened its seed. It is frequently observed that the seeds of the mignonette which scattered themselves in the autumn produce finer plants than those that are sown in the spring, which should teach us to sow a part of our seed at that season of the year in pots or boxes, kept in frames through the winter or in a green-house.

A REPORT.

SECRETARY CORWIN employed J. D. Andrews to make a full report on the Fisheries, Colonies, Canada, Western Lakes, Rivers, Railroads, &c. The work is done. The Washington Correspondent of the *Tribune* declares it to be invaluable as a book of reference, and gives as follows some of the more important results:

"The gross value of the commerce of the lake ports, in 1851, was $326,000,000; licensed American tonnage, 215,000 tons; entered and cleared at all other ports, about 9,500,000 tons. Our commerce with Canada was over $12,000,000, of which over two thirds were exports. The Canada trade of 1852 has fallen off $1,500,000, while the lake coasting-trade has increased about 25 per cent., making a gross aggregate for last year of over $400,000,000. There will soon be completed an aggregate length of 25,400 miles of railroad in the United States, costing about $650,000,000. Over 11,300 miles are now in actual operation; the balance is in progress.

"The British colonies have an area of 218,339,415 acres, and a population of 2,500,000; a commerce with all countries amounting to $70,200,000, of which about $19,000,000 is with the United States, and $30,000,000 with Great Britain. These colonies own and employ shipping measuring nearly 500,000 tons. Full statistics of the fisheries are contained in this report, accompanied by an historical view of the English, French and American fisheries, and the regulations by which they are governed. Commercial notices, with detailed statements of the commerce of all the principal lake and river towns, the aggregate tonnage of the lakes and rivers, and aggregate value of river commerce, are all given a place, and are full of interest. A most interesting account of the commerce of the Gulf of Mexico, an able document on the cotton crop of the country, and some commercial statements of the business of the most prominent Atlantic cities, close the document in an appropriate manner. The statistics of cotton and manufactures of cotton, as an article of commerce, show a most wonderful and unprecedented advance in the consumption of that staple since 1790, at which time we were importers. The annual value of the crop may now be stated to be $100,000,000; and this article constitutes fully one half the value of all our domestic exports to foreign countries. Several very fine maps are to accompany the report, as illustrations of its different sections—the colonies, the Lake and St. Lawrence basin, the railways, the Mississippi Valley and the Gulf of Mexico, Cuba and the Isthmus of Tehuantepec.

RAILWAY IRON.

THE following remarks from the Boston *Railroad Times* will be read with attention by all those engaged in the construction of new lines of railway, who have yet to purchase their rails. If it be true, as stated, that it will fully occupy all the rolling-mills in the world which are engaged in making rails, at least *six years* to supply the iron for the roads already begun, some of those projected must wait a long time for iron to complete their lines, and the difficulty is not to be overcome by any increase in the price of iron:

The sudden and great advance which has recently taken place in the price of railway iron, is a circumstance of unusual importance to various interests of this country. In less than a year, the price of railway iron in Great

Britain—which is the principal seat of its manufacture and its controlling market—has advanced £5, or $25, to £10, or $50, per ton. There is every reason to believe that it will continue to rise, and not stop short of £12 or £14 per ton. Six years ago, iron went up much in the same way, rising in a very brief period from £5 to £12 per ton. This advance was then produced, as it is now, by the projecting and constructing of a great number of railways, with the essential difference that the mania at this period was confined chiefly to England, whereas now it is diffused over many countries, raging most furiously in our own, and embracing a much vaster aggregate of projects. The railways in progress which produced the great advance in iron in 1847, did not exceed three thousand miles in aggregate length, though a much larger amount was projected, and afterwards partially abandoned. The investment of capital in these British railways caused the most disastrous commercial revulsion experienced in Great Britain. It ruined many hundreds of her richest merchants, and produced a long-continued prostration of every industrial interest, from which it required years of patient labor and economy to recover.

From the best information accessible to the public, it appears to be quite certain that there are now in progress, and in actual course of construction, in Europe and America, at least twenty thousand miles of iron railroad, besides a vast amount of projected railroad not yet begun, which we do not take into account. Of this amount of railroad in progress, 5,000 belongs to Europe, and 14,000 at least to this country, exclusive of more than 1,000 miles now constructing in Canada. We have seen a list made out of the railroads now under way in each State, which amounts in the aggregate to more than 13,000 miles; and which list has understated rather than overstated the truth, for in this State alone it omits 60 miles of railroad in actual construction, and has made similar omissions as to other States. However incredible the aggregate may appear at first sight, it is impossible for the most careful scrutiny to make any deduction from it.

Railways require at least 100 tons of iron for a single track, and of the roads in progress in Europe, 1,000 miles will be made double-track road. It follows from this that the railways now in the course of construction in Europe and America will require for their completion no less than 2,400,000 tons of iron. To make this quantity will occupy all the rolling-mills in the world which are engaged in the manufacture of railway iron, at least six years—those of Great Britain furnishing three fourths, and the United States, France, and Belgium, the remaining fourth. The best authorities do not estimate the largest quantity of railway iron in any one year even as high as 400,000 tons, yet even at this rate it will take six years to furnish iron for the roads already begun.

The necessary consequence of this state of things is, that the price of railroad iron will not only be kept up, but farther advance, and be maintained at very high prices for a long time. This will make the manufacture of railroad iron the best manufacturing business that can be undertaken in this country for some years; for it is affirmed on the best authority, that the article which is now selling at $70, with every prospect of advancing at least $80 per ton, pays a fair profit to the maker at $50 per ton.

The advance in iron will nearly double the cost of many of the railways at the West and South, for the cost of grading upon some of them was less per mile than the cost of the iron, even before it advanced. The profit to a few of the companies which have secured their iron at low rates will be very large. The English railroad companies are now compelled to pay $10 per

ton more for their iron at home than the price at which our railroad companies were enabled to obtain it about a year ago, freight and duties included.

SILESIAN IRON.

The most extensive display of iron, in all the stages of its manufacture, is sent from the numerous forges of Hutten of Count Renard, who alone occupies a large portion of the basement of the building. The quality of the metal produced at his works has secured a local reputation, though other establishments, as the Laura Works, at Beuthen, produce iron in bar and the larger forms in greater quantity. The Renard Works are unrivalled in the finer sorts; and of hoop iron, nail rods, wire, cast iron for cooking vessels, steel in many varieties, especially forged steel of the finest quality, there is a most abundant supply. Sheet iron is exhibited from these works, of such a degree of tenuity that the leaves can be used for paper. A bookbinder of Breslau has made an album of nothing else, the pages of which turn as flexibly as the finest fabric of linen rags. As yet no extensive application for this form of the metal has been found, but the manager says the material must precede the use for it; perhaps books may hereafter be printed for the tropics on these metallic leaves, and defy the destructive power of ants of any color or strength of forceps. We have only to invent a white ink, and the thing is done. Of the finest sort the machinery rolls 7,040 square feet of what may be called leaf iron, from a hundred-weight of metal. In point of price, however, the Silesian iron cannot compete with the English; much is still smelted with wood, and the coal and iron districts lie at great distances from each other, so that much capital is consumed by the conveyance of fuel to the works.—*London Mechanics' Magazine.*

TOPPING COTTON.

Mr. E. Jinkins, of Horn Pen, Miss., writing in the *Southern Cultivator*, says:

Having again tried the experiment of topping cotton, I herewith give you the result of the same for the *Cultivator*. On the 1st of August I measured off one acre of land of the same quality, and the stand as near the same as I could select on the plantation. I topped, this year, two rows, and skipped two throughout the acre, and the result is as follows:

Topped rows made of seed cotton, - - - - -	513 lbs.
Rows not topped, " " - - - -	462 "
In favor of topping, - - - - -	51 "

You will see, Messrs. Editors, that I have made money this year by the operation, as it only took three days to top my crop, and I have made by it 36,720 lbs. of seed cotton. I will, for the satisfaction of others, try the experiment for three years to come, if I live; and although the difference may not be so great every year as it has proved to be in the year 1852, I still say that topping cotton in Mississippi is advantageous, wet or dry, and very important in a wet season. I will here say to those who are fearful of causing their cotton to sucker in wet weather from topping, that I have never been able to see, in twenty years' experience in farming, that topped cotton was more subject to sucker than that not topped. Too much rain on cotton

planted in rich new land, or land highly manured, will bring out suckers, and as many on that not topped as on the topped; at least, this is the result of my observation in Mississippi, the opinions of others to the contrary notwithstanding.

NEW CITY HALL CLOCK.

Messrs. Sherry & Byram, of Sag Harbor, Long Island, have completed the new clock for the City Hall; and by their courteous invitation we have carefully examined it. It is a perfectly finished work. Every part seems exactly what it should be. It is to have four dials, and to cost, by contract, $2000.

The frame of the clock is composed of iron and composition metal, the length of which is 4 feet, the width 2 feet, and the height 2½ feet; or, including the bed, plate and pedestal, the whole height is 4½ feet. The weight of the whole is about 1000 lbs., 300 lbs. of which are iron and steel, the remainder brass and composition.

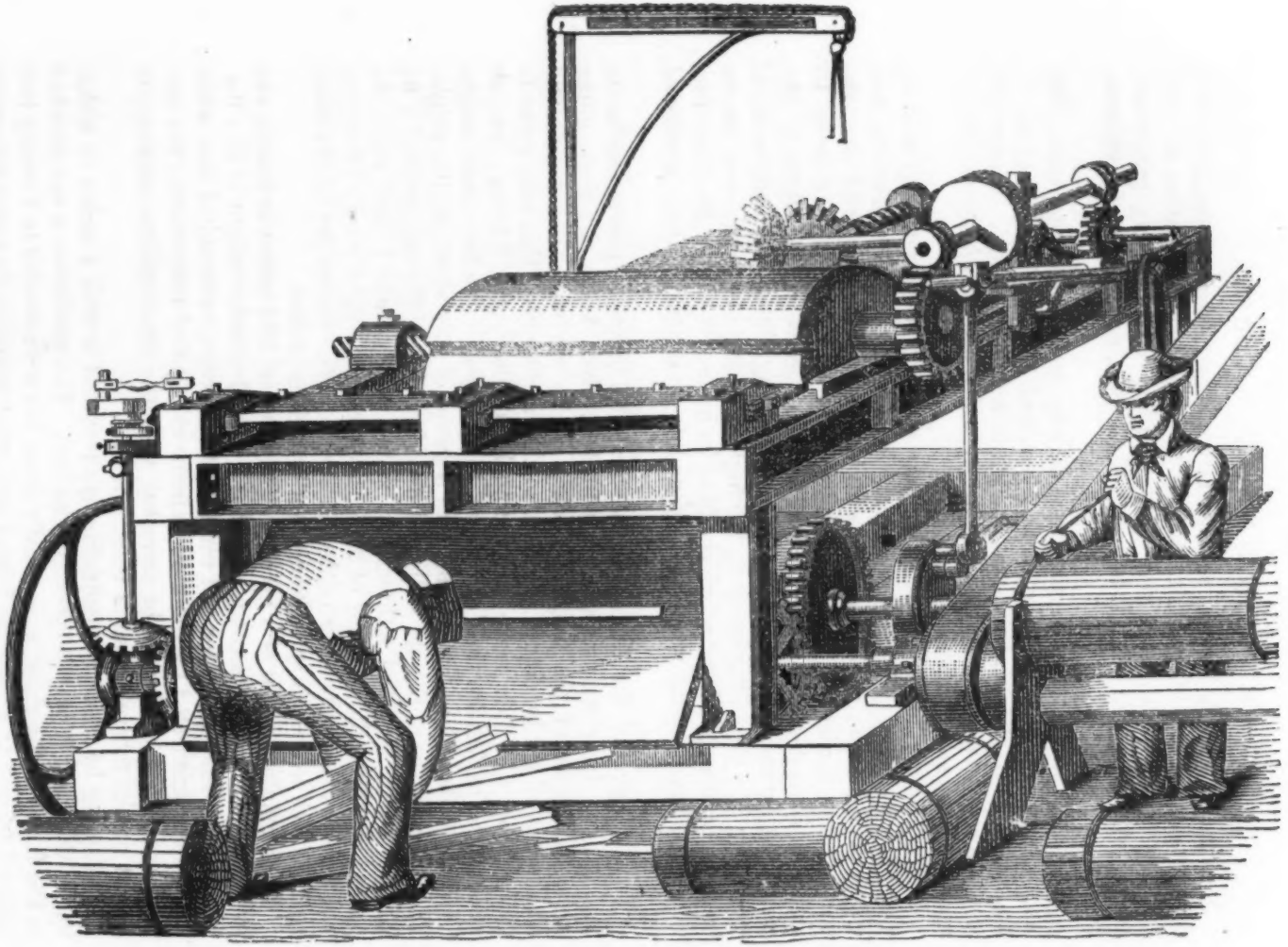
The works are so constructed that any wheel may be removed without disturbing the next. The large or main wheels are 20 inches in diameter, and weigh 60 lbs. each; the other wheels all in proper proportion, and all of the purest brass, hardened in its composition. The barrels are also of brass, 10 inches in diameter, and of length sufficient to receive sixteen turns of the cord, which gives the clock eight days of running time. The arbors are of cast steel; the pivots hardened to the highest degree of temper, and run in bosses of a compound metal, which, from its nature, is almost free from friction, and, from several years' use, is found to be almost perfectly unaffected by wear.

To the barrel of the time train is attached a retaining power, similar to that used in lever watches and chronometers, which keeps the clock going while the action of the weight is taken off in winding. The wheels and pinions are all cut in aliquot numbers, so that any wearing that may occur in the gearing will only serve to continually diminish the friction; and so smooth and perfect are their operations, that, although the time train weighs nearly 200 lbs., it is now running with a power of only about 60 lbs. weight. The scapement is of the old well-tried dead-beat form: the scape-wheel is 6½ inches in diameter; and although its acting part is near 1 inch upon the pallets, yet, from the neatness of its construction, its weight is only 10 ounces, and turns on its pivots in two splendid jewels. The pallets are of the finest agate, 1 inch in length and breadth, set in sockets of steel.

The pendulum rod is of a peculiar kind of wood, 168 inches in length, and swings once every two seconds, and has a brass lenticular weight of 120 lbs., with a compound regulator and compensating fixture, so arranged that, while it is utterly unaffected by the most extreme changes of temperature, the performance of the clock may be corrected, with the most minute certainty, to almost perfect measurement of time.

The spring by which the pendulum is suspended is near 2 inches in width, but its thickness is only 5-1000ths of an inch. The pendulum is not attached to the frame of the clock, as is usually done, but is suspended to a strong iron support secured to a standard braced with great strength, thus preventing any possibility of the rocking of the frame that would occur from its vibrations with so heavy a body attached.

A powerful winding gear is affixed to each barrel, and the parts so constructed that the pinion is shifted from one barrel to the other, and disengaged when the weights are wound up.



WILLIAM BULLOCK'S PATENT LATH-CUTTING MACHINE.

WILLIAM BULLOCK'S PATENT LATH-CUTTING MACHINE.

We present to our readers, on the opposite page, a view of this new invention. It is capable of cutting 6000 laths per hour from rough logs, and all the preparation that is necessary is to saw the logs the length of the laths desired, and place the logs in the machine. It commences cutting at the periphery, and cuts in a spiral form to the centre, without waste of stuff. It will cut square logs as well as round, and it is claimed that it will cut smoother and of an evener thickness than any other machine in the world. It can be set to cut to any thickness or width, and is adapted to cutting blind-slats, etc. It was awarded the highest premiums at the fairs of the American, Franklin, and Maryland Institutes.

For machines or rights, apply, personally or by letter, to W. Fisk Brink, No. 3 Spruce street, New-York.

WILLIAM BULLOCK'S PATENT LATH-CUTTING MACHINE.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

SIZE OF AXLES.

Mr. Editor:—In your April number there appears an article on the "Mechanics of Wheels," which appears reasonable. But there is one important principle connected with wheeled carriages not mentioned in that article, nor understood by carriage-makers. That is: What is the relative size of the axletree to the wheel to get the best advantage in the draught? For instance, if a carriage with four-feet wheels and one-inch arm runs easier than the same sized wheels with two-inch arm, then what should be the size of wheel for two-inch arm? Or if a large arm works easier, why use small ones? There must be a proper point to touch, in carriages of all kinds, to get an easy draught, and the length of the arm has a bearing upon this fact. If it is too long, there is unnecessary friction; if too short, the wheel will not run steady, and the wabble requires more power to propel. I trust some of your scientific readers can give the needed information, for which they will receive the thanks of a CARRIAGE MAKER.

Oswego, April 4, 1853.

We have already said so much on this subject that we are not disposed to add much more of our own, though we should be glad to get the views of our readers, as suggested by our new friend in Oswego, and especially the views of practical men.

In our November and December numbers, 1852, we proved, to our own satisfaction at least, that the size of an axletree, for wheels of all sizes, should be the smallest that is safe in the matter of strength; but that this is true only before the boxes are *worn*. In railroad cars it is found that the smallest arms wear the boxes so fast as actually to increase the amount of friction over that of larger sizes. The amount of friction and the weight to be sustained must, therefore, be taken into the calculation in all decisions of this question.

But there is another point worthy of attention—the length of the hub; or, if boxes are used, as they were years ago, at what distance should they be placed? If the more recent single box, or cylinder, running through the hub, is used, how long should it be? Theoretically, the answer is easy. The shortest hub consistent with a regular motion of the wheel, on the surfaces upon which it is to run, whether smooth or rough, is the best. Practical observers must tell us what this length, in a given case, is proved to be.

NEW BOOKS.

The Slave Trade, Domestic and Foreign; why it exists and how it may be abolished. By HENRY C. CAREY, Author of the "Principles of Political Economy," "The Past, Present and Future," &c., &c. Philadelphia: A. Hart, 126 Chestnut street. 1853. pp. 426.

Mr. Carey's reputation as a writer can gain nothing by any commendation of ours. He is too well known, not merely to the readers of this Journal, in which many of his most able and thorough discussions have originally appeared, but to the educated world, to require of us any such service. But this very fact, independent of his relation to these pages, claims from us a mention of this, his *latest*, but we hope not his *last* work.

Mr. Carey regards all *absolute dependence* as slavery. It matters little to the victim, so far as the present is concerned, whether his condition is the result of special laws, decreeing him a slave, or of systems of political economy which deprive him of the power of self support. Hence, he writes of English slaves and Irish slaves, &c. Mr. Carey contends that the real independence of all communities must be based on a judicious industrial system; and on this, he appeals to the fact, that no nation has ever emerged from a state of degradation into one of civilization and financial prosperity, by any other means. "The habit of association" is the first step; internal improvements, agricultural and mechanical progress, increased population, trade and commerce—these are the only road to national power. The slave is "a creature of necessity;" a freeman, "a being of power." It is the development of this principle which is so fully and so ably discussed in the volume before us. In this process, and an essential part of it, in its place, is the introduction of the mechanic arts. The plough, the loom, and the anvil, the lapstone, the trowel, &c., must be set side by side, and the Irishman, the African, &c., will no longer be an article for export. Without these pursuits, the tendency is to slavery, as now seen in Portugal, Turkey, India, &c. The doctrines now popular in England, and so favorably regarded in certain quarters in our own country, are shown to be unfavorable in their results, even at home, while they are ruinous to other nations. In England, the consumption of ardent spirits greatly increases, and the use of opium has more than doubled in the last ten years. The number of prostitutes is enormous, while "shirts are made at a penny apiece, by women who find needles and thread, and artificial flowers are made at two pence a day. Again, the number of land-owners has decreased in that country, from 35 per cent. in 1811, to about 22 per cent. In 1841, the *actual* number was less than it had been thirty years before.

We follow the lead of British statesmen, while "Mark Lane governs the world's prices," and the price of cotton and of food rises and falls in New-York, Philadelphia, &c., according to the demand of the London merchant. This is a meagre abstract, but we hope it is sufficient to induce every reader to buy this book forthwith.

The Life of Bernard Palissy, of Saintes: his Labors and Discoveries in Art and Science, with an Outline of his Philosophical Doctrines, &c. By HENRY MORLEY. In two vols. Boston: Ticknor, Reed & Fields. 1853.

Our readers will remember a short extract from this "life" in our April number, and the notice of this volume should have appeared at that time, but was accidentally omitted. It is a most instructive book, well worth a careful reading. It has a due mixture of biography, history, and philosophy; and if you are not in a mood for one, select the other. But you will be sure so to read as to keep along the story of this wonderful man. We scarcely know such an example of fortitude and successful perseverance, under so many obstacles and so severe trials. Would that our young men would imitate his example!

Village Life in Egypt; with Sketches of the Said. By BAYLE ST. JOHN. In two vols. Boston: Ticknor, Reed & Fields. 1853.

This is a well-told story of actual observation, by one quite familiar with the country. The author is sometimes, perhaps, too plain-spoken, but his style is always direct and unpretending, and has an air of truthfulness that never dreams of incredulity in the reader.

The pictures are various—presenting views of all the colors and shades, even of Egyptian life, Mohammedans, Bedawis, Goommas, Fellahs, Muslems, Sheiks, &c., with a due sprinkling of dancing-girls. Few of these classes commend themselves to a cultivated taste, but are proper subjects of study, as historic facts or contemporary existences.

Horæ Vacivæ; a Thought Book of the Wise Spirits of all Ages and all Countries; fit for all men and all hours. Collected, arranged and edited by JAMES ELMES, author of, &c. Boston: James Munroe & Co. 1851.

This little volume, like the two preceding, has been too long neglected, not so much from our choice as the "*imposer's*," whose "forms" are strictly non-elastic. But it is not too late to say that this book deserves an honorable place among the Coltons of the times, and well exemplifies the doctrine, not only that "thoughts take up no room," but also that the expression of many and valuable ones may be comprised in a very small volume.

The preface is by that learned and classic divine, Rev. A. H. Vinton, D. D., of Boston; and that gentleman's well-deserved reputation is a guaranty that the purchaser of this little book is sure of the value of the consideration he may pay for it.

American Dictionary of the English Language. By NOAH WEBSTER. Revised and enlarged by Chauncey A. Goodrich. 1 vol., crown quarto. pp. 1452. Published by G. & C. Merriam, Springfield, Mass.

Who needs to be told of the existence and grandeur of London or Paris? When we find such a man, we shall probably find one who knows not the fame of Webster's Dictionary. What London is to the commercial world, and what Paris is to the world of fashion, such is this book to all others of its class. It has no rival. Its learning is immense; its scope as comprehensive as language; while it is as accurate as human labor in this department can be. It is the work of many years, and will live as long as the English tongue preserves its present forms, while no one instrument will prove more efficient than this in securing permanence to those forms.

It is this unrivalled volume which we have offered as a premium for a club of ten subscribers, at our published prices. See advertisement on last page of the cover.

The Popular Educator. May, 1853. New-York: Alexander Montgomery, 17 Spruce street. Vol. 1, No. 1. pp. 48. 12½ cents per number.

This enterprising publisher presents to us another valuable monthly. We have before spoken of his Illustrated Magazine of Art in terms of high commendation, and this new candidate for public favor presents strong claims to our regard.

It is well adapted to aid in the education of families, and is a valuable acquisition to parents as well as teachers. It commences with the simplest elements of the several sciences, and proposes to advance step by step in its monthly issues till each science is fully exhibited. Space will be allotted in every number to each of the following departments: Language, Natural History, Mathematics, Physical Science, Industrial Science, Fine Arts, Anthropology, History, Philosophy, Political Science, and Civilization. Under the first head, in the branch of Phonetic Writing, we should have preferred the system of Phonography, so universally approved, to any other. It is more practical, and we believe it to be the best form of phonetic writing.

The United States Writing Book, on the Inductive Method, &c. By J. H. NOYES, Principal of the South Grammar School, Newburyport, Mass. Newburyport: John G. Tilton & Co. New-York: Cady & Burgess, and Pratt, Woodford & Co.

We have examined this series of books carefully, (as we have many others,) and believe that we have seen none better than this. It is inductive in substance as well as in name, and contains all that belongs to a regular and thorough system. We commend it to the attention of teachers and school committees. There are six books, with copies in each, three of fine hand, and three of coarse hand.

EDITORS' JOTTINGS, ETC.

OPENING OF THE CRYSTAL PALACE.—The Architects of the Crystal Palace have reported in writing to the Directors that the building will be completed and ready for the reception of goods by the middle of June; and the Directors feel confident, therefore, that they will be enabled to open the Exhibition between the 1st and the 15th of July. The charge for admission is fixed at fifty cents.

READING'S CORN SHELLER.—The readers of the *Farmer and Mechanic* will remember a description of this new invention given in the number of that journal for Oct., 30, 1852. Slots are made in the lower half of the main cylinder, now the only one used. We have just made a visit to Mr. Reading's shop, at No. 280 Thirty-seventh street, (New-York Moulding Mill,) and carefully examined the sheller, and the manner of its operation. One man cannot shovel the corn into the hopper fast enough to keep it supplied, and the cobs are delivered unbroken, and cleaner than they are in the ordinary mode of shelling. In fact, from what we saw, we doubt not the accuracy of Mr. Reading's statement that it will shell 200 bushels an hour. The contrivance is very simple, and not liable to get out of repair. The machine can be purchased for a small sum.

Mr. Reading has also in charge a patent invention for kiln-drying corn, patented by J. S. Stover, in 1851, which we also saw in operation. It is so planned as to save all the heat of the fuel consumed, and requires very little labor in taking care of it. It delivers about 500 bushels a day, well cured.

IMPORT OF GOLD IN 1852.—The amount of gold received at the port of New-York, during the year 1852, is reported, in the *Merchants' Magazine*, at over $48,000,000. The San Francisco *Price Current and Shipping List*, by Adams & Co., gives a table of monthly exports from the port of San Francisco, during the year 1852, amounting to $45,559,171, of which $39,007,367 was destined for the port of New-York, and $6,020,027 for London, the balance for New-Orleans and Panama.

AMERICAN COMMERCE WITH CHINA.—We are indebted to a friend for the *Shanghai North China Herald* of January 1. The most interesting item of news which it contains is a report of the Harbormaster of Shanghai, Nicholas Baylies, (who, by the way, is a Massachusetts man.) The report shows the total amount of tonnage in Shanghai from Jan. 1 to Dec. 31, 1852. It appears that the American tonnage exceeded that of any other nation. The number of British vessels was 102, with a tonnage of 32,700; of American vessels 71, with a tonnage of 40,365. The whole amount of tonnage was 76,900, and the number of vessels 187—the remainder, besides English and American, being almost equally divided between French, Danish, Hamburg, Spanish, Hawaiian, and Dutch.

The exports of tea from Shanghai in 1852 were 57,675,000 pounds, which is about equal in amount to the exports of the two previous years.

The exports of tea from Shanghai to Great Britain, from July 1 to December 31, 1852, were 17,825,000; to the United States, 15,400,900.

We take the following from the *Scientific American*:—

SHIP BORING MACHINE.—An improved apparatus for the purpose of boring treenail holes in ships' bottoms has been invented by Samuel T. Sanford, of Fall River, Mass., who has taken measures to secure a patent. This machine very much lessens the difficulty experienced by shipwrights when boring treenail holes in the bottoms of ships. The auger stock is connected by a ball and socket, or other universal joint, to a long pole, which is supported by a standard, but capable of motion in either a horizontal or vertical plane. A couple of pulleys and a band transmit the motion of a shaft resting in the standard to the auger, so that it revolves. This plan allows the tool to be brought to any required point, and will permit it to bore in any direction, whilst the power to do so can be applied on the ground, or wherever the standard can be readily placed. The workman can quickly remove the auger from the stock by a neat arrangement of a screw-thread and tongue, and a stock-guard having small sharp pins at its end serves to maintain the position of the tool.

POWER-LOOM SHUTTLE.—An improved shuttle motion, of a simpler kind than that generally employed in power-looms, has been invented by William Crichton, of Fall River, Mass., who has taken measures to secure a patent. The improvements consist in connecting the two pickers by means of a rigid rod, so that it is made imperative for both to move together, the motion being

imparted by a picker lever, which is operated upon to throw the shuttle in both directions by a single cam on a short shaft at one side of the loom. The results obtained by this improvement are the giving to the pickers a perfectly parallel motion by simpler mechanism than that commonly employed for the purpose, and thus dispensing with the long shaft and with one cam—the invention being altogether less complicated and expensive than the separate mechanism employed in most looms to drive the shuttle in each direction.

Improved Auger.—Measures to secure a patent for an improvement in augers and bits have been taken by Chas. P. Crossman and Levi T. Richardson, of Fitchburg.

Papier-Mache in Architecture.—There is a church, near Bergen, chiefly composed of this material. "It is circular within and octagonal without. The relievos outside and the statues within, the roof, the ceiling, the Corinthian capitals, are all of papier-maché, rendered water-proof by saturation in vitriol, lime-water, whey, and the white of an egg." Dickens describes it in his Household Words.

Gelatine.—How to get a pennyworth of beauty out of old bones and bits of skin, is a problem which the French gelatine-makers have solved very prettily. Does the reader remember some gorgeous sheets of colored gelatine in the French department of the Great Exhibition? We owed them to the slaughter-houses of Paris. Those establishments are so well organized and conducted, that all the refuse is carefully preserved, to be applied to any purposes for which it may be deemed fitting. Very pure gelatine is made from the waste fragments of skin, bone, tendon, ligature, and gelatinous tissue of the animals slaughtered in the Parisian abattoirs; and thin sheets of this gelatine are made to receive very rich and beautiful colors. As a gelatinous liquid, when melted, it is used in the dressing of woven stuffs, and in the clarification of wine; and as a solid, it is cut into threads for the ornamental uses of the confectioner, or made into very thin, white, and transparent sheets of *papier glacé* for copying drawings, or applied in the making of artificial flowers, or used as a substitute for paper on which gold printing may be executed. In good sooth, when an ox has given us our beef, and our leather, and our tallow, his career of usefulness is by no means ended; we can get a penny out of him as long as there is a scrap of his substance above ground.—*Household Words.*

Inside Door Fastener.—Duncan E. McDougall, of Troy, N. Y., has taken measures to secure a patent for a new door fastener. A plate is bent at right angles, so that a part can be inserted under the door whilst the upper portion presses against the entrance. On the back of this plate is a bar whose back end is formed of ratchet teeth, and having a series of holes cut through its face. To this bar are secured two curved levers, which can be adjusted to suit the threshold. One lever is set below the other, and is attached by one end to a door plate, having a number of sharp spikes for catching in the floor. The other lever forces the first-named plate against the door, and also gives it a downward thrust: it also acts upon the lever which presses horizontally against the door plate, the two levers being forced apart by a set screw, and the position of the first lever being insured by the ratchet.

Tanning.—An improvement in the process of tanning has been made and patented by E. Moride, of Nantes, France. The improvement consists in the employment of an ooze cylinder, in which the oozes for tanning are prepared in a cold state, out of contact with the atmosphere. The subused in tanning—is placed in the cylinder on stance—oak, hemlock, and other bark to be a perforated diaphragm, and water is admitted to cover it and fill the cylinder. Steam at the pressure of two or three atmospheres is then admitted above the water, by which it is forced through the bark and diaphragm, carrying with it the soluble matters of the bark, and discharging it into proper vessels. Two or three waters are thus pressed through the bark or tanning matters in the ooze cylinder until its strength is exhausted. Different tanning qualities are thus obtained from the same bark, to be used at different stages of tanning, well known to those skilled in the art. A patent for this useful improvement has also been applied for in this country.

Improvements in Saw Mills.—T. L. Jones, of Natchez, Miss., has invented certain improvements in mills for sawing logs. Mr. Jones has a method of communicating power from the wheel or crank to the saw sash, by which considerable friction is avoided, and the mill rendered far more portable. This is accomplished by using a short pitman attached to the crank or driving shaft, by means of an elbow or bent connecting rod. This prevents the pitman, although much shorter than those of the usual construction, from moving out of line with the saw sash. Mr. Jones has also taken the power to give the feed mo

tion to the carriage directly from the driving shaft, instead of taking it from the saw sash, in the usual manner. This prevents the lateral motion frequently given to the sash, by attracting the feed to it, and, at the same time, gives an effectual and regular motion to the log. Measures have been taken to secure a patent.—*Exchange Paper.*

Glass Pens are now made, and it is said they answer the purpose well. It is known that with a flux of lead, in combination with the silicon, in right proportions, glass can be made very ductile. These pens are now becoming not uncommon, and they are perfectly anti-corrosive by the most impure ink.

New Reversable Stove Pipe Collar.—R. R. Finch, Jr., of New-York City, has invented and taken measures to secure a patent for the above. By means of this improvement, the necessity for an elbow is in most cases obviated. A collar is placed over the flue of the stove and attached to it by a button. This collar may be inclined in various directions at pleasure, in order to receive the stove pipe from the chimney at any angle desired. The pipe may pass from the stove horizontally, or extend up any desired distance before it enters the flue of the chimney, the change being effected without the use of elbows, as in the usual manner.

Treatment of Persons taken from Water.—Dr. Valentine Mott gives the following directions for the treatment of those who may have been partially suffocated by immersion in water:

Immediately after the body is removed from the water, press the chest suddenly and forcibly, downward and backward, and instantly discontinue the pressure. Repeat this without interruption, until a pair of common bellows can be procured. When obtained, introduce the nozzle well upon the base of the tongue. Surround the mouth with a towel or handkerchief, and close it. Direct a bystander to press firmly upon the projecting part of the neck, called Adam's apple, and use the bellows actively. Then press upon the chest to expel the air from the lungs, to imitate natural breathing. Continue this at least an hour, unless signs of natural breathing come on.

Wrap the body in blankets, place it near a fire, and do every thing to preserve the natural warmth, as well as to impart an artificial heat, if possible. Every thing, however, is secondary to inflating the lungs. Send for a medical man immediately.

Avoid all frictions until respiration shall be in some degree restored.

India Rubber Teeth.—This article, in the form of purified white India rubber, has been patented in England, for making artificial teeth, gums, and palates. By its adoption, many advantages hitherto impossible to be attained have been introduced. The adhesion is complete, it can be moulded with perfection, to suit every inequality of the gums and teeth, and supplies an artificial periosteum, as it were, to the teeth, when become painful by the wasting away of the gum. Added to these, is the elasticity of the material, which completely obviates the inconveniences that arise from any motion with artificial teeth as made by other means.

Improved Fluid Burner.—Measures to secure a patent for improvements in the above have been taken by Samuel F. Allen, of New-York City. This improvement consists in employing, in place of the ordinary lamp, a large fluid vessel or reservoir, which is to be filled with sufficient fluid to last a long time, and set at some suitable and safe distance from the place where the combustion of the fluid takes place, and in such a position that the fluid, in finding its level in the wick tube, will not rise higher than the top of the horizontal flame tube. The communication between the two is maintained by a flexible tube, which thus supplies the latter with fluid for combustion, and a screw nut is fitted at the bottom of the wick tube, which serves as a stand for the latter, and can be taken off when a fresh wick is required. To prevent the wick from burning away too quickly, it is encased in a wire gauze, which also serves to render the light more brilliant by supplying the fluid in a broader jet or stream.

The Quebec Water Company have tried gutta percha pipes with complete success. They bore a pressure of one hundred and five pounds to the square inch, and, the *Chronicle* says, could apparently have sustained double that pressure. The brase couplings twice gave way, but not the pipes.

New Process for making Daguerreotype Plates.—An improvement in the construction of these plates has been invented by George Englehard, of New-York City. His method is, instead of forming the base of the plate of copper, and then coating it with silver, a pure zinc plate is used for the electrotype process, or a zinc plate first coated with copper and then with silver, and afterwards polished in the usual manner. Mr. Englehard thinks these plates take impressions more readily and leave a

finer picture than those made by the old process. The expense of making these plates is less than those of copper. Measures are taken to secure a patent.

NEW RAILROAD FROG.—An improved railroad frog has been invented by Benjamin H. Overshire, of Binghamton, N. Y., who has taken measures to secure a patent. The point of the frog is secured in the bed-plate by having the lower portion of the point of a dovetailed form, which fits in a correspondingly shaped groove in the bed-plate, the point being secured in its place by means of a wedge or key, which is at the back end of the point, and forms a portion of it when in its proper position.

MANUFACTURE OF PAPER.—It is well known that paper which is very white when first made, often becomes yellow some time after being used. The yellow color is not always uniform, but often comes out in spots more or less large, of a circular outline and a rusty tint. In some Paris manufactories, this defect (which is incorrectly attributed to an alteration of the fibre) is remedied in a simple manner; and as the process of decoloration may not be commonly used in America, judging from some paper I have seen, I make a brief mention of the subject.

The researches were made here by a manufacturer who combines in a high degree science and technology. M. Gélis recognized at first that the change of color was not due to any alteration in the ligneous fibre, and was owing to iron. But what the source of the iron? and how is it introduced? An examination of the manufacture, through its processes, shows that there is less iron in the pulp than in the paper made from it. The origin of the iron is hence not in the preparation of the pulp, but it must be attributed to the drying cylinders of steel under which it is passed while yet moist. The chlorine contained in the paste, and which it is very difficult wholly to remove by the washing process, becomes suddenly vaporized under the heated cylinders, attacks these cylinders, and forms the protochloride, (Fe Cl,) which thence impregnates the paper. Colorless itself, this chloride gradually absorbs oxygen on exposure to the air, and thus the coloration takes place.

It is therefore not a remedy against iron but against chlorine that is required. The hyposulphite of soda is the simple antidote, and a very small quantity suffices to eliminate a large quantity of chlorine, since one equivalent of hyposulphurous acid requires four equivalents of oxygen, and therefore four equivalents of chlorine, to transform it into sulphuric acid.

For testing the complete removal of the chlorine, M. Gélis uses a liquor made of iodide of potassium and amidon, (starch.) This liquor becomes instantly blue if there is the least trace of chlorine.

WHITE SHEEP-SKINS FOR DOOR-MATS.—We find the following in the *Scientific American*:

Take two long-wooled sheep skins, and make up a strong lather of soap: the sign of proper strength is when the lather feels slippery between the fingers. When the lather is cold, wash the skins carefully in it, squeezing them between the hands so as to take all the dirt out of the wool. When this is accomplished, lift out the skins and wash them well in cold water until all the soap is extracted. Have a vessel of clean cold water ready, to which some alum and salt (about half a pound) which have been dissolved in a small quantity of hot water are added, and the skins left to steep all night. They are taken out in the morning and hung over a pole to drip. When all the alum water has dripped off, they are spread out on a board to dry, and are carefully stretched with the hand from time to time. Before they are thoroughly dry, a composition of two tablespoonfuls of alum and the same of saltpetre are ground to powder in a mortar or otherwise, and sprinkled carefully on the fleshy side of each skin.

They are then placed the one on the top of the other, leaving the wool outside, and hung upon a rack of slats, in a barn, shed, or dry airy place, for about three days, or until they are dry. They should be turned every day. After this they are taken down, and the flesh side is scraped with a blunt knife, and each skin trimmed for a mat. The flesh side may then be rubbed over with pipe-clay, beat with a switch, and will then be found supple, of a beautiful white color, and fit for a door-mat for a mechanic or a prince.

JEWELRY.—It is estimated that jewelry to the value of $3,000,000 is manufactured yearly in New-York. There are sixteen large houses engaged in the business, and several small establishments. One concern does business to the amount of $500,000 a year, and employs about 150 men. The wages vary from $10 to $18, and some men earn as high as $25 and even $30 per week. The workmen are mostly Germans, though there are many French and Americans. The gold used is chiefly that of sovereigns; the refined gold from the bullion offices is likewise worked up.

THE BAY STATE LINE.—This favorite line through Fall River to Boston, continues to receive abundant patronage. This is right. Old friends who do everything in the best manner, ought not to be and will not be deserted. The very courteous gentlemen, Messrs. Borden & Tisdale, have filled the stations of captains and clerks, and subordinate places with those who thoroughly understand their business, and who exhibit the same gentlemanly deportment as their employers. They have done all that could be claimed, promptly and without constraint, liberally and to mutual satisfaction. Agents, captains, clerks, &c., are every thing that can be asked for. We never hesitate to send ladies by this route, though unattended by gentlemen. They are certain to receive respectful attention.

THE account of the new City Hall clock, on page 369, was prepared for our May number, but found no room. The clock has since that time been removed to its place in the cupola of the City Hall, and it counts out the hours and minutes with remarkable accuracy.

POISONS.—It was Liebig's theory that arsenic proves poisonous not by virtue, so to speak, of its own venom, but by arresting those processes of decomposition and destruction which are always going on among the solids and fluids of the body, as an essential agency of life. Dr. Cockle, of England, in his late pamphlet "On the Poison of the Cobra di Capello," thinks the poison of that serpent acts by promoting unduly those processes. Granting that both are right, the poison of the cobra and arsenic may be quoted as types of two different classes of poison, the septic and antiseptic.

TUNNELLING OF THE ALLEGHANY MOUNTAIN.—One of the tunnels on the Pennsylvania Railroad, now constructing, is to be 3,570 feet in length. Its area at the widest space within the lines of the masonry will be about 24 feet, and the spring of the arch will begin 16 feet from the crown of the arch. The arch itself of the tunnel will be rather of an oval form, one of the most beautiful curvatures which conic sections can afford. The greater part of the vast arched excavation will be inlaid with strong and substantial masonry. More than half of this masonry will be composed of sandstone well laid in hydraulic cement, and the remainder will be hard-burnt brick. This whole masonry will be 22 inches thick. The tunnel passes the Alleghany Mountain in Sugar Run Gap, and lies partly in Blair and partly in Cambria county. Taking into account the length of the tunnel and its interior breadth, and the quantity and solidity of its masonry, it may be regarded as the largest work of the kind in the United States. About 400 men are employed upon it. The contractors who are accomplishing this great work are J. Rutter & Son, perhaps the most eminent tunnel contractors in the country. They are men of untiring energy, and of the utmost resolution, judgment, enterprise, and shrewdness, and withal gentlemen in every sense of the word.

IMPROVED TRIP-HAMMER.—Measures to secure a patent for improvements in the above have been taken by William Van Anden, of Poughkeepsie, N. Y. In this invention there are two distinct improvements. The first enables the workman to regulate the force with which the hammer descends upon the anvil, and the second is a superior manner of placing the friction rollers which receive the action of the cams. The hammer shaft is attached to a collar which works loosely around a shaft provided with a spring, whose duty is to force down the hammer, which it does with more or less energy according to its adjustment. When the cam shaft is made to rotate, the hammer shaft is elevated by the action of the cams against the friction rollers, which are placed in a frame capable of vibration, so as to relieve the cams after their highest points have performed their functions. A third cam, acting through the medium of a lever and set-screw, causes a spring to bear against the hammer shaft when the downward motion is to take place.

SAWING MACHINE.—Measures to secure a patent for an improved construction of the above, by which it is rendered more suitable for certain kinds of work, have been taken by Thomas J. Alexander, of Westerville, Ohio. The advantage of this plan is, that logs can be sawn directly into broom handles, chair rounds, &c., without having been previously sawn into planks, thus economizing an important item of expense. One horizontal and two vertical saws, adjusted in relative positions, serve to cut the sticks from the logs, the vertical saws being placed underneath the horizontal saw, and nearly touching it. The log is secured between screw rods passing through the cross-piece of a reciprocating frame, and which are raised or depressed by turning a crank so that the log can be adjusted with facility.

THE VENOM OF RATTLESNAKES, &c.—A late *Boston Traveller* contains a report of the proceedings at a meeting of the Boston Society of Natural History, at their March session. One of the papers read was in relation to the rattlesnake, which is of especial interest to the naturalist; and one por-

tion of it is of great importance to all, and more particularly to our agricultural friends, who, in some sections of the country, are more especially exposed to the bite of these reptiles. Various experiments, conducted under the most favorable circumstances, have shown that the action of this poison on animals is that of a most powerful sedative, acting, through the blood on the nervous centres.

This is shown, says the report, by the remarkable fact that its full and complete antidotes are the most active stimulants. Of these, alcohol, in some shape, is the first. Two cases are given. Mr. B. was bitten just above his heel, three quarters of a mile from home. The usual symptoms of acute pain and large swelling immediately followed; he succeeded, however, in reaching his house, but complained of blindness and universal pain. Brandy was then given to the amount of a quart in an hour. This produced a little nausea, but not the least intoxication. In the next two hours, another quart had been given, followed with relief of pain and subsidence of swelling, but without the least intoxication. Stimulants were kept up in small quantities during the ensuing forty-eight hours, with the gradual passing off of the local and other symptoms. He kept his room the three following days, complaining only of a general soreness. After this, he was about as usual; but a few weeks after, his hair fell off entirely.

Miss F. was bitten in her middle finger. The usual severe symptoms immediately followed, but brandy, with the addition of a little ammonia, was freely given and continued in large doses, until relief of symptoms, but without the least appearance of intoxication, although in health the individual could not probably have borne a single ounce. The symptoms gradually disappeared, and on the third day the patient was well generally, although the finger sloughed.

These statements are of unquestionable reliability, and they are of great moment. A specific for this poison, and for the hydrophobia, would be of incalculable worth.

As to the latter, we remember a very interesting account of a cure effected on himself, if we are not mistaken, by an equally free use of laudanum, by the eminent gentleman recently at the head of the Pittsfield (Mass.) Medical College. Perhaps we can favor our readers with a particular statement hereafter in relation to that case.

Lightning Rods.—A late *Traveller* says: We have lately had our attention called to Otis's Patented Insulated Conductor for buildings and vessels, and must acknowledge that we are more pleased with it than with any other conductor that has fallen under our notice. With the recent total loss of the magnificent clipper "Golden Light" fresh in our minds—burnt at sea from the effects of a stroke of lightning, together with the disastrous effects of lightning to buildings and life on shore, accounts of which we read in almost every daily journal—it strikes us as singular that more attention is not paid to averting this dreadful visitation of nature, by the use of a safe conductor. The invention to which we refer was shown to us at the office of the New-England Scythe Agency, in Post-office Avenue, where we also saw testimonials as to its sure efficacy from some of our most distinguished scientific men. Since Dr. Franklin first put lightning into harness, quite a number of conductors have been constructed on different principles, and used with varied success, but this one is vastly superior to all that have preceded it, in its perfect insulation from the building or vessel, and its peculiar form and connection. It needs but to be known and seen to be appreciated, and the inventor will no doubt reap a rich reward for his labors.

Improvement in Daguerreotype Cases.—In March last, a patent was issued for a very pretty addition to these cases It consists of a narrow lid, attached to the cover of the case, on the side opposite the hinge, in which lid are two small lenses, of a suitable focal distance. This gives to the picture a distinct and lifelike appearance. The picture, of course, is to be placed with the top or head opposite the hinge, and not with the side towards it, as it is usually placed. We have repeatedly observed the capital effect of viewing such pictures through a lens, although it reveals any imperfections that may exist. Hence good pictures are required for such exhibitions.

New York Tax-payers.—The number of persons in this city, taxed, in 1850, for $17,500 and upwards is 3,421; for a less amount, the number is estimated at about 30,000.

Purifying Fatty Materials.—A patent was issued in February last, which claims to be an improvement in this process. It applies to the treatment of fatty matters with alkalies. A current of sulphurous acid gas is made to pass through this mixture, by which it is freed from impurities, and which also hardens it, thereby improving the quality of the candles made from it. The purity and brightness of the flame is also said to be increased.

List of Patents Recently Issued.

Robert Adams, of London, Eng., for Improvement in Revolving Fire-Arms.

Richard L. Hinsdale, of New-York, N. Y., for Improvement in Exercising Machines.

George Kendall, of Providence, R. I., for Improvement in Mould Candle Apparatus.

Daniel Reid, of Washington, N. C., for Improvement in Manure Carts.

G. W. Reid, of Evansville, Indiana, for Improvement in Corn Shellers.

P. J. Steere, of Cheshire, Mass., for Improvement in Sawing Barrel Heads.

J. S. Taylor, of Danbury, Ct., for Improvement in Machines for Shrinking Hat Bodies.

C. N. Tyler, of Worcester, Mass., for Improvement in Repeating Fire Arms.

S. R. Wilmot, of New-Haven, Ct., (assignor to Joseph Kent, of Baltimore Co., Md.,) for Improvement in Apparatus for Drawing Water from Wells.

Patrick O'Reilly, of Reading, Pa., for Improvement in Rails for Railroads.

J. D. Steele, of Pottstown, Pa., (assignor to C. E. Smith, of Philadelphia, Pa.,) for Improvement in Rails for Railroads.

Asahel G. Bachelder, of Lowell, Mass., for Improvement in Counter Silks.

Nehemiah Dodge, of New-York, N. Y., for Improvement in Pump Valves.

E. L. Evans, of Hartford, Conn., for Improvement in Washing Machines.

Thomas S. Minniss, of Meadville, Pa., for Improvement in Invalid Chairs.

Jonathan W. Morrill of Hampton Falls, N. H., for Improvement in Etching Machines.

Enoch Osgood, of Bangor, Me., for Improvement in Fastening Leather Beltings.

John W. Richards, of Hoboken, N. J., for Improvement in Registering Apparatus for Printing Presses.

John P. Sherwood, of Fort Edward, N. Y., for Improvements in Machines for Making Wrought Iron.

Frederick E. Sickels, of New-York, N. Y., for Improvement in Operating and Controlling the Rudders of Steam Vessels.

John H. Snyder, of Troy, N. Y., for Improvement in Machines for Making Hook-headed Spikes.

George A. Whipple, of Newark, N. J., for Improvement in Manufacturing Malleable Iron directly from the Ore.

D. Winder, of Xenia, Ohio, for Improvement in Locomotive Engines.

Charles F. Sibbald, of Philadelphia, Pa., for Improvement in Paint Compounds. Patented in England, October 15, 1852.

John Mee, of Lowell, Mass., (assignor to John Mee and Robert Rourke, of same place, and Gilbert Mackennon, of Portsmouth, N. H.,) for Improvement in Knitting Looms.

John Mee, of Lowell, Mass., (assignor to John Mee and Robert Rourke, of the same place, and Gilbert Mackennon, of Portsmouth, N. H., for Improvement in Warp Net Fabrics.

James M. Patton and Wm. F. Fergus, of Philadelphia, Pa., (assignors to John C. Da Costa, of same place, for Improvement in Tongueing, Grooving, and Moulding Cutters.

James Young, of Philadelphia, Pa., (assignor to John W. Middleton, of same place,) for Improvement in Printing Presses.

Thomas A. Chandler, of Rockford, Ill., for Improvement in Pendulum Levels.

Moses Coburn, of Savannah, Ga., for Improvement in Violins.

Edwin Forbes, of Boston, Mass., for Improvement in Vertical Pianos.

Samuel Fox, of (near) Sheffield, Eng., for Improvement in Umbrellas and Parasols. Patented in England, April 6, 1852.

Lewis L. Gilliland and Joseph R. Wagoner, of Dayton, Ohio, for Improvement in Sofa-Bedsteads.

John H. H. Hawes, of Ithaca, N. Y., for Improvement in Calendar Clocks.

Matthaus Heim, of Cincinnati, Ohio, for Improvement in Cooking Stoves.

Abner H. Longley, of Lebanon, Ind., for Improvements in the Machines for Cutting Wooden Screws.

Frederick Mathesius, of New-York, N. Y., for Improvement in Upholstering Furniture.

Julius A. Pease, of New-York, N. Y., for Improvement in Seeding Hoes.

Wm. J. Thorn, of Westbrook, Me., for Improvement in Pocket Combs.

Wm. W. Wade, of Springfield, Mass., for Improvement in Castors for Furniture.

Halsey D. Wolcott, of Boston, Mass., for Improvement in Graduated Cutters for Cloth and other Substances.

Davis L. Weatherhead, of Philadelphia, Pa., for Improvement in Cleansing and Cooling Block Dies in Rivet Machines.

Samuel J. Seeley, of New-York, N. Y, for Improvement in Lime Kilns. Antedated November 17, 1852.

James A. Woodbury, of Winchester, Mass., Joshua Merrill, of Boston, Mass., and George Patten, of Charlestown, Mass., for Improvements in Air Engines. Patented in England, January 5, 1853.

Wm. Cresseler, of Shippensburgh, Pa., for Improvement in Seed Planters.

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